



INSTITUTE FOR DEFENSE ANALYSES

**Assessment of the Need for Assistance  
to Communities Affected by Chemical  
Demilitarization: Final Report**

Thomas P. Frazier, Project Leader

John W. Bailey

John J. Cloos

Henry L. Eskew

Shaun K. McGee

Alec W. Salerno

with the assistance of:

James R. King

June 2001

Approved for public release;  
distribution unlimited.

IDA Paper P-3623

Log: H 01-001318

**This work was conducted under contract DASW01 98 C 0067, Task AP-7-1975, for the Assistant to the Secretary of Defense (Nuclear, Chemical, and Biological Defense Programs). The publication of this IDA document does not indicate endorsement by the Department of Defense, nor should the contents be construed as reflecting the official position of that Agency.**

**© 2001 Institute for Defense Analyses, 1801 N. Beauregard Street, Alexandria, Virginia 22311-1772 • (703) 845-2000.**

**This material may be reproduced by or for the U.S. Government pursuant to the copyright license under the clause at DFARS 252.227-7013 (NOV 95).**

INSTITUTE FOR DEFENSE ANALYSES

IDA Paper P-3623

**Assessment of the Need for Assistance  
to Communities Affected by Chemical  
Demilitarization: Final Report**

Thomas P. Frazier, Project Leader  
John W. Bailey  
John J. Cloos  
Henry L. Eskew  
Shaun K. McGee  
Alec W. Salerno

with the assistance of:  
James R. King



## **PREFACE**

The Institute for Defense Analyses (IDA) prepared this paper for the Assistant to the Secretary of Defense (Nuclear, Chemical, and Biological Defense Programs) under a task titled “Independent Assessment of the Economic Impact That May Be Caused by Chemical Demilitarization Facilities to Surrounding Communities.” The objective of the task was to identify the economic impact of ongoing or planned chemical demilitarization activities at eight different locations on surrounding communities. This paper fulfills that objective by assessing the impact on the eight communities affected.

Julia Klare Burr, Stanley A. Horowitz, and David R. Graham of IDA were the technical reviewers for this paper.



## CONTENTS

Executive Summary .....	S-1
I. Introduction.....	1
A. Background.....	1
B. Six Study Criteria.....	2
C. Cost and Benefits to Whom? .....	5
D. Time Horizon of the Study .....	5
E. Outside the Scope .....	6
II. Methodology.....	7
A. Economic Models .....	7
B. Control Forecast versus Simulations .....	9
C. Data Used to Drive Economic Models .....	11
D. Data Collected Through Meetings and Interviews .....	11
E. A Note About Blue Grass and Pueblo .....	12
F. Study Criteria and IDA’s Approach .....	13
III. Results.....	15
A. General Results .....	15
1. Why Some Regions Experience Net Gains and Others Net Losses .....	16
2. Caveats.....	19
3. Corroboration.....	19
4. Other Considerations .....	20
B. Anniston Army Depot (Alabama).....	21
1. Composition of the Region .....	21
2. Period of the Analysis.....	22
3. Simulated Effect.....	22
4. Other Considerations .....	23
C. Blue Grass Army Depot (Kentucky) .....	23
1. Composition of the Region .....	23
2. Period of the Analysis.....	24

3. Simulated Effect.....	24
4. Other Considerations .....	25
D. Deseret Chemical Depot (Utah).....	26
1. Composition of the Region .....	26
2. Period of the Analysis.....	26
3. Simulated Effect.....	26
4. Other Considerations .....	27
E. Edgewood Chemical Activity (Maryland).....	28
1. Composition of the Region .....	28
2. Period of the Analysis.....	29
3. Simulated Effect.....	29
4. Other Considerations .....	30
F. Newport Chemical Depot (Indiana).....	30
1. Composition of the Region .....	30
2. Period of the Analysis.....	30
3. Simulated Effect.....	30
4. Other Considerations .....	31
G. Pine Bluff Arsenal (Arkansas).....	32
1. Composition of the Region .....	32
2. Period of the Analysis.....	32
3. Simulated Effect.....	33
4. Other Considerations .....	33
H. Pueblo Chemical Depot (Colorado).....	34
1. Composition of the Region .....	34
2. Period of the Analysis.....	34
3. Simulated Effect.....	35
4. Other Considerations .....	36
I. Umatilla Chemical Depot (Oregon).....	37
1. Composition of the Region .....	37
2. Period of the Analysis.....	37
3. Simulated Effect.....	38
4. Other Considerations .....	38



IV. Conclusion .....	41
Appendix A. People Who Met with Study Team.....	A-1
Appendix B. REMI Linkages.....	B-1
Appendix C. Technical Adjustments to REMI .....	C-1
Appendix D. Data Templates .....	D-1
Abbreviations .....	E-1

## FIGURES

1. Stockpile Locations.....	1
2. Data Collection Template .....	12
3. Deseret Emploment and Population Projections .....	17
4. Pine Bluff Emploment and Population Projections .....	18
5. Umatilla Emploment and Population Projections.....	18
6. Region Surrounding Anniston Army Depot .....	21
7. Anniston Region’s Annual Net Revenues: DoD Schedule.....	22
8. Region Surrounding Blue Grass Army Depot .....	24
9. Blue Grass Region’s Annual Net Revenues: DoD Schedule.....	25
10. Region Surrounding Deseret Chemical Depot.....	26
11. Deseret Region’s Annual Net Revenues: DoD Schedule .....	27
12. Region Surrounding Edgewood Chemical Activity .....	28
13. Edgewood Region’s Annual Net Revenues: DoD Schedule .....	29
14. Region Surrounding Newport Chemical Depot.....	30
15. Newport Region’s Annual Net Revenues: DoD Schedule .....	31
16. Region Surrounding Pine Bluff Arsenal.....	32
17. Pine Bluff Region’s Annual Net Revenues: DoD Schedule.....	33
18. Region Surrounding Pueblo Chemical Depot.....	34
19. Pueblo Region’s Annual Net Revenues: DoD Schedule .....	35
20. Pueblo Region’s Annual Net Revenues: ACWA Schedule.....	36
21. Region Surrounding Umatilla Chemical Depot.....	37
22. Umatilla Region’s Annual Net Revenues: DoD Schedule .....	38

**TABLES**

S-1. Present Value of the Net Economic Effect of .....S-3  
Demilitarization Activities: DoD Schedule

1. REMI’s Revenue and Expenditure Variables ..... 9

2. Organizations That Contributed Employment Data ..... 11

3. Study Criteria and Approach ..... 13

4. Net Present Value of the Economic Effect ..... 41

## **EXECUTIVE SUMMARY**

### **BACKGROUND**

To comply with provisions of Public Law 99-145 and the Chemical Weapons Convention, the United States is required to destroy its chemical weapons stockpile by April 2007. These weapons are stored at the following eight locations in the continental United States: the Anniston Chemical Activity in Alabama, the Blue Grass Chemical Activity in Kentucky, the Deseret Chemical Depot in Utah, the Edgewood Chemical Activity in Maryland, the Newport Chemical Depot in Indiana, the Pine Bluff Chemical Activity in Arkansas, the Pueblo Chemical Depot in Colorado, and the Umatilla Chemical Depot in Oregon.

Members of the congressional defense committees are concerned about any negative economic consequences that the demilitarization activities might have on the communities surrounding each of the eight facilities. Congress directed that the Secretary of Defense complete an assessment and make recommendations regarding whether federal economic assistance is needed and appropriate to assist any of the affected communities in meeting the effect of the demilitarization program. In January 2001, the Department of Defense (DoD) tasked the Institute for Defense Analyses (IDA) to conduct a study to determine whether federal compensation to those communities is warranted.

### **SCOPE**

The congressional language from National Defense Authorization Act for Fiscal Year 2001 defining the scope of the assessment appears below (HR 106-945, Section 152, p. 647).

- (1) The impact that any change in population as a result of chemical agent demilitarization activities would have on the community.
- (2) The possible temporary nature of such a change in population and the long-range financial impact of such a change in population on the permanent residents of the community.

- (3) The initial capitalization required for the services, facilities, or infrastructure to support any increase in population.
- (4) The operating costs for sustaining or upgrading the services, facilities, or infrastructure to support any increase in population.
- (5) The costs incurred by local government entities for improvements to emergency evacuation routes required by the chemical demilitarization activities.
- (6) Such other factors, as the Secretary [of Defense] considers appropriate.

IDA studied these criteria by combining economic modeling techniques and case studies.

## **METHODOLOGY**

IDA used a regional economic model that captures the complex economic interactions among the various counties in the United States through a large number of linked parametric equations calibrated from 30 years of county and state data. This model, developed by Regional Economic Models, Inc., allowed us to estimate for each region the incremental costs and benefits associated with the construction, systemization, operation, and closure of the chemical demilitarization facility. Examples of incremental costs are those incurred from additional police, fire fighters, schools, water treatment, and other public service activities needed due to the increase in population resulting from the facility. Incremental benefits arise from the increased tax revenues realized by the local communities, land transfers, and purchases of equipment and supplies that result from building and operating the facility.

The life cycle of a typical facility begins with a Resource Conservation and Recovery Act (RCRA) permit followed by a several-year construction and systemization period. Once the facility is ready for use, weapons are destroyed during an additional several-year operation period, which is followed by closure of the facility. This entire process is scheduled to take from 10 to 20 years depending on the location and the amount of stockpile to be destroyed. To fully capture the effect of these activities on the local economy, we used the regional economic model to estimate the annual costs and benefits to the region for 35 years after the date of the RCRA permit. We continued to consider the effects after each facility closed to allow time for the local economies to return to equilibrium.

## RESULTS

Table S-1 presents the estimated net economic effects on local and state governments for each of the eight facilities by core county (the county in which the facility resides), region (the core county plus all contiguous counties), and state. (Only state revenues and expenses from the counties contained in the region are used to compute the net state effects.) The results are presented in discounted constant year dollars (2001). The figures in the table reflect the accumulated costs and benefits for 35 years from the date of the RCRA permit and assume that construction, systemization, operation, and closure of each facility will occur according to the current DoD schedule. For Pueblo (where the method of destruction is still being considered) only the effect of the Assembled Chemical Weapons Assessment (ACWA) approach of chemical treatment followed by biodegradation is shown since the effect under that approach was more adverse (negative) than under incineration. This is consistent with our general rule of erring on the side of community compensation so as to ensure that we have not underestimated any of the appropriate compensation amounts.

**Table S-1. Present Value of the Net Economic Effect of Chemical Demilitarization Activities: DoD Schedule**

Facility	Net Effect (\$K)		
	Core	Region <sup>a</sup>	State
Anniston	(1,800)	(1,900)	26,400
Blue Grass	(3,600)	(2,700)	36,300
Deseret <sup>b</sup>	(24,200)	(21,400)	38,900
Edgewood	(500)	(600)	8,500
Newport	(4,000)	(2,500)	9,600
Pine Bluff	3,800	5,300	37,100
Pueblo <sup>c</sup>	(2,100)	(3,000)	24,300
Umatilla	3,500	4,700	77,100

Note: Parentheses denote net negative effects.

<sup>a</sup> Core county (or counties) plus contiguous counties.

<sup>b</sup> Figures do not include over \$14 million in benefits from disposal fees and medical facility grants.

<sup>c</sup> Represents the estimated effect of the ACWA process rather than of the baseline incineration process.

The figures in the table show the net results from modeling 35 years of economic activity at all eight sites for the following three definitions of community: (1) the core counties, (2) the regions consisting of the core counties plus all surrounding counties, and (3) the host states. Each column shows a separate set of results, depending on the

definition of community used. In other words, based on the modeling, the results suggest that the Anniston core county could experience a net loss over 35 years of \$1,800,000 and that the region could experience a net loss of \$1,900,000, but that the state of Alabama could gain \$26,400,000 over the same period.

The computations suggest that the net economic effects are usually, though not always, negative for the core counties as well as for the greater local regions. The core counties for six of the facilities suffer an average loss of \$6 million, with individual negative effects ranging from less than \$1 million to \$24 million over the 35 years modeled. The remaining two counties stand to gain between \$3 million and \$4 million each, according to the model's computations. The same six facilities that show losses at the core level also show net economic losses ranging from \$1 million to \$21 million at the regional level. For the other two regions, we expect to see a net gain of about \$5 million each in additional revenue by the end of their modeling periods. At the state level, however, the model consistently predicts a positive economic effect, resulting in an average of \$32 million of additional state revenue per facility.

At first glance, these results are surprising. One might expect that the infusion of more than a billion dollars into a region would always be advantageous to the local economy. If that were not true, why were the communities we observed trying so hard to attract businesses to their jurisdictions? Closer inspection suggests the negative effects are due to the unnaturally sharp business cycles induced by the chemical demilitarization projects in these localities. The rapid infusion of construction expenditures is followed by several years of chemical demilitarization jobs that pay higher than average wages for the region. In general, all regions and states enjoy net gains during this active period. However, these benefits end quickly when the facility is closed. The temporary, higher-paying chemical demilitarization jobs turn out to be detrimental to most areas in the long run because they have inflationary effects on labor rates and real estate prices that cannot be sustained once employment returns to its prior levels. Further, investments made to accommodate the additional population must now be amortized over the declining population and wage base following closure. Compared with most economic investments of this magnitude, the life cycle of the demilitarization activity is unusually brief. It is difficult to find a comparable analogue to the practice of building a complex, billion-dollar facility, operating it for a few years, and then closing it down. In other words, it is not the demilitarization activity per se that causes a negative effect; it is the sudden economic vacuum following plant closure that is detrimental to a community.

The variation in net revenues accruing to the states is explained in large part by the state income tax rates. Of all the states involved, Oregon and Arkansas have the highest state income tax rate and the highest net revenues, respectively. (Umatilla's core counties are on the Washington state border, so a portion of the net state revenue for this facility will accrue to the state of Washington.) At the county and regional levels, the reasons for the variations are subtler. They involve many factors, including the likelihood of sustained economic activity after a facility closes, whether workers relocate to the area or commute, and whether families relocate temporarily or permanently to the region when taking advantage of employment opportunities at a facility. While we took utmost care to ensure the fidelity of the economic modeling, for example, by updating population figures to Census 2000, these results are conditioned on sets of employment, expenditure, and schedule input that are estimates.

## **ADDITIONAL CONSIDERATIONS**

A fundamental point the Secretary may want to consider is what constitutes a community. If the state is defined as the community then the Secretary may reasonably decide that no economic assistance is warranted since, for every facility, the gains at the state level outweigh any losses in the regions. If the community is defined as either the core or the region, compensation would have to correspond to the larger amount (more negative) associated with each facility. This idea is explored in detail at the end of Chapter III.

Congress also requested that the study address other factors the Secretary considers appropriate. IDA interpreted this criterion to cover those factors that were (1) not amenable to economic modeling, (2) outside the scope of the study but related to the general topic of the effect a facility might have on its community, or (3) socioeconomic issues that the communities felt strongly about and wanted to call to the attention of the Secretary.

To that end, IDA participated in more than 50 meetings with local elected officials, community leaders, state officials, and concerned citizens. In total we met with over 250 people. At each site the study collected information on the concerns of the community. The most common concerns were related to the need for roads, bridges, and interchanges. In some cases, those concerns were deemed outside the scope of the study. In other cases, issues were raised about factors that were difficult to measure. While each site had its own unique set of issues and concerns, two topics were common to almost all sites. These were the perceived inadequacy of evacuation options and the inability to

attract and retain business investments. The latter concern was related to the common complaint of declining property values due to the stigma caused by chemical agent incineration and other demilitarization activities.

When available, we included community estimates of the magnitude of these concerns in our report, but such estimates were not factored into the economic effects computed for each community. Although independent economic quantification of these concerns was not within the scope or capability of this study, they are among the additional factors the Secretary may want to consider.



## I. INTRODUCTION

### A. BACKGROUND

To comply with provisions of Public Law 99-145 (as amended) and the Chemical Weapons Convention entered into force April 29, 1997, the United States is required to destroy its unitary chemical weapons stockpile, binary chemical warfare materiel, currently recovered non-stockpile chemical warfare materiel, and former chemical weapons production facilities by April 29, 2007.<sup>1</sup> The destruction of the unitary weapons stockpile is scheduled to take place at eight facilities in the continental United States. The 10-year destruction process at a ninth site on Johnston Island, which is part of the Johnston Atoll southwest of Hawaii, was completed in November 2000 and only the final closure operation remains. Figure 1 shows the location of each facility and lists the types of chemical agents residing there.

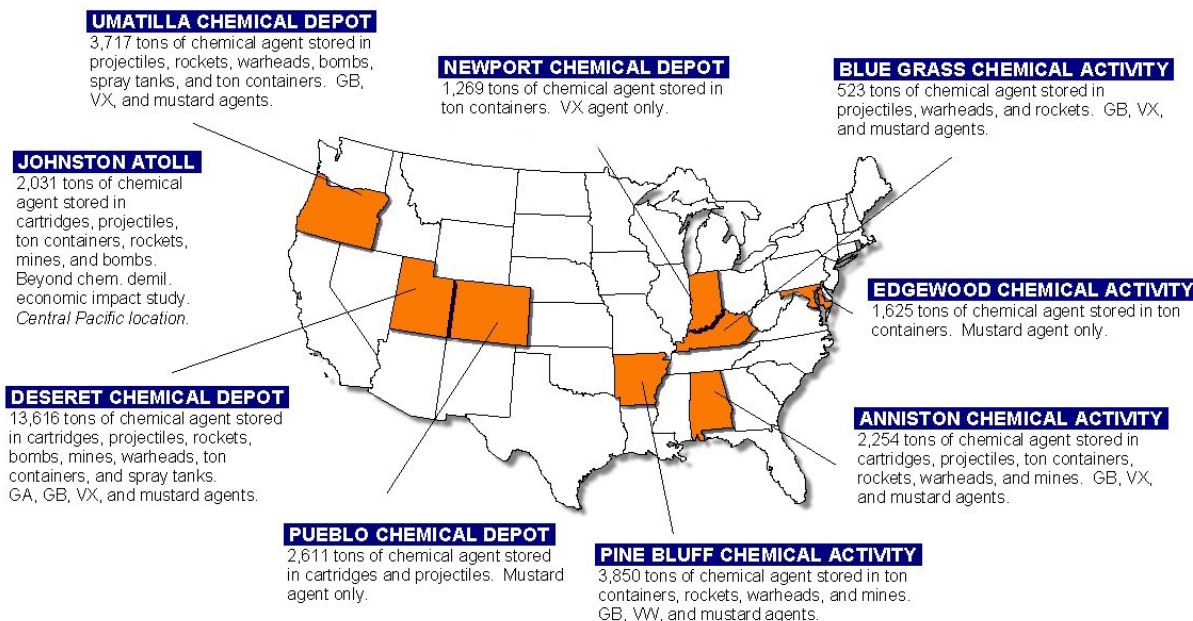


Figure 1. Stockpile Locations

<sup>1</sup> The chemical stockpile includes nerve agents in rockets, projectiles, land mines, bombs, spray tanks, and bulk containers. The stockpile also contains mustard agent in projectiles, cartridges, and bulk containers.

The chemical stockpile will be destroyed either through incineration or chemical treatment processes in demilitarization facilities that each cost in excess of one billion dollars to build, operate, and close. Construction of the facility at Deseret is complete and destruction of the stockpile is well underway. Facility construction at Edgewood, Newport, Pine Bluff, Anniston, and Umatilla is underway. Construction at Blue Grass and Pueblo is on hold pending determination of the destruction technology to be used.

The Department of Defense plans to complete construction and operation of these eight facilities over the next 6 years. The new facilities have the potential to demand significant increases in the public services required to support the demilitarization efforts.

As part of the National Defense Authorization Act for Fiscal Year 2001, Congress directed the Secretary of Defense to complete an assessment and report on the economic effect on the communities surrounding the eight facilities of demilitarizing chemical weapons, and to include a recommendation of whether federal compensation to those communities is warranted. The Act calls for the Secretary of Defense to provide this report to the Senate and House Committees on Armed Services. The specific language is as follows:<sup>2</sup>

The Secretary shall include in the report a recommendation regarding whether Federal economic assistance for any or all of those communities to assist in meeting the impact of that program is needed and appropriate. If the Secretary's recommendation is that such economic assistance is needed and appropriate for any or all of such communities, the Secretary shall include in the report criteria for determining the amount of such economic assistance.

In January 2001, the Department of Defense asked the Institute for Defense Analyses (IDA) to conduct the required economic assessment.

## **B. SIX STUDY CRITERIA**

The Act also directs the Secretary of Defense to consider six criteria in evaluating the incremental economic effect to the communities where chemical demilitarization activities will occur. The criteria, excerpted from the legislation,<sup>3</sup> are listed below, followed by examples of relevant things the IDA study team measured.

---

<sup>2</sup> National Defense Authorization Act for Fiscal Year 2001, HR 106-945, Section 152, p. 647.

<sup>3</sup> Ibid.

*(1) The impact that any change in population as a result of chemical agent demilitarization activities would have on the community.*

Community effects will result from both the initial increase in population and the eventual decrease in population due to chemical agent demilitarization activities. Population changes can be short term (such as those resulting from temporary construction workers), medium term (such as those that result from multi-year jobs leading to the relocation of families to the affected area), or long term (such as losses of residents at the conclusion of the activities). Certain specific effects are described in additional detail in the other study criteria.

*(2) The possible temporary nature of such a change in population and the long-range financial impact of such a change in population on the permanent residents of the community.*

The short-, medium-, and long-term population changes must be computed over time in order to accommodate the changing activities associated with chemical demilitarization tasks. The financial effects of short-term population increases include the cost of assuring the availability of temporary housing, food, transportation, and other associated infrastructure services. The financial effects of medium-term population increases include the cost of assuring the availability of permanent housing for families and the associated schools, utilities, and other services required. The financial effects from the permanent loss of residents at the conclusion of the chemical demilitarization activities include the effects of oversupply of housing, the possible closing of facilities, the loss of associated tax revenues, and the loss of state transfer payments.

*(3) The initial capitalization required for the services, facilities, or infrastructure to support any increase in population.*

Short- and medium-term population increases may require certain capital investments, depending on each community's size and ability to accommodate the growth. These investments must be made up-front, even when subsequent tax revenue will only partially offset the costs. For example, the addition of schools, roads, utilities, and community services could lead to a shortage of capital. The cost of capital to support any required up-front investments (e.g., interest on bonds or other loans) may be included in the financial effect modeling for each community.

*(4) The operating costs for sustaining or upgrading the services, facilities, or infrastructure to support any increase in population.*

Beyond initial capital investments to support population increases, other costs may be incurred to maintain or upgrade the existing community infrastructure. These include costs to expand existing schools, roads, and utilities; costs to increase existing police and fire protection; and costs of business development loans that may be needed to augment existing commercial services (e.g., stores, restaurants and entertainment facilities).

*(5) The costs incurred by local government entities for improvements to emergency evacuation routes required by the chemical demilitarization activities.*

The cost of emergency preparedness is another component of the financial effect of chemical demilitarization activities. The Federal Emergency Management Agency (FEMA) has already begun the Chemical Stockpile Emergency Preparedness Program (CSEPP) to study these costs. Although each community has existing plans and procedures to deal with chemical incidents, they might require amendment to handle the additional residents or infrastructure improvements required by the chemical demilitarization activity (e.g., construction workers).

*(6) Such other factors, as the Secretary [of Defense] considers appropriate.*

IDA interpreted this criterion to cover those factors that were (1) not amenable to economic modeling, (2) outside the scope of the study but related to the general topic of the effect a facility might have on its community, or (3) socioeconomic issues that the communities felt strongly about and wanted to call to the attention of the Secretary.

Some factors are not easily quantifiable by any economic model. Economists call these factors externalities. Negative externalities arise when members of the economy take actions that involve no cost to them but are detrimental to others. Relevant examples of this effect are the perception of environmental effects, the perception of communities as dumping grounds (which, in turn, hinders the attraction and retention of businesses), and the perception of reduced quality of life.<sup>4</sup> The study also revealed some positive externalities, such as corporate donations to communities and schools.

---

<sup>4</sup> Another type of negative externality can result from expensive and complex projects such as the construction and operation of these chemical demilitarization facilities. When a firm (or in this case, the federal government) significantly increases its output, the extra demand causes a rise in the price of its input (e.g., skilled labor). That increase makes it more expensive for other companies who use similar input. This type of externality is called a pecuniary externality. A number of business leaders expressed

### C. COST AND BENEFITS TO WHOM?

It is feasible to consider the economic effect of a chemical demilitarization facility from several viewpoints. Among them are:

- The economy within the Immediate Response Zone (IRZ) or the Protective Action Zone (PAZ),<sup>5</sup>
- The local community or county where the facility is located,
- The region surrounding and including the local community or county,
- The state in which the facility is located, and
- The United States as a whole.

We decided to focus on measuring what we call the core of the area (the county or, in Umatilla's case, counties where the demilitarization facility is actually located) and the surrounding region (the core plus all counties contiguous to the core). In addition, we measured the costs and benefits that accrue to the state. Although other definitions of *community* are possible, we limited ourselves to the county and state because of the methodology we used. We did not attempt to use either the IRZ or the PAZ as a basis for measurement since they represent only geographical areas of risk versus economic areas. Also, while it would be possible to trace the effects of a chemical demilitarization facility on the entire U.S. economy, such a measure seemed beyond the scope intended by Congress.

### D. TIME HORIZON OF THE STUDY

For each community, we defined the time horizon for computing economic effect as a 35-year period beginning with the receipt of the Resource Conservation and Recovery Act (RCRA) permit. The 35-year period is consistent with the REMI model's forecasting period and allows us to capture the economic effects that continue to reverberate after the

---

concern about this type of effect. The model we used attempts to account for this upward pressure on local wage rates.

<sup>5</sup> Protective measures are based on two planning zones, the IRZ and the PAZ. These zones were developed for emergency planning purposes and do not necessarily follow political boundaries. The boundaries of each zone and the distances from the stockpile vary since the zones were drawn following risk analyses that took into account the specific types of agents and munitions stored, as well as local weather and geographic conditions. The Immediate Response Zone is the area closest to the site where chemical munitions and agents are being stored until they can be destroyed. Usually covering the area within a 6- to 9-mile radius of the stockpile, the IRZ would require the quickest warning and response. People living or working in this zone may need to take protective measures quickly. The Protective Action Zone is the area immediately beyond the IRZ. This zone extends to a radius of 6 to 31 miles from the stockpile, again depending on the specific agents and other factors.

facility closes. For each facility, a 35-year set of annual economic effects was estimated for each of the three areas examined by the study: the county or counties where each facility is situated, each greater local region consisting of this core plus all of its contiguous counties, and each state containing either a core or contiguous county.

A separate issue concerning time in this study has to do with the planned duration of the construction, systemization, operation, and closure of the facilities versus the actual time it is likely to take. At every site the study team visited, public officials voiced concerns if not outright skepticism of the Department of Defense's stated schedules. As a result of these comments, we decided to take into account the possibility that the official DoD schedules may slip. More on this topic is presented in the next chapter.

## **E. OUTSIDE THE SCOPE**

The scope of the study is limited to an assessment of the economic effect of only the chemical demilitarization activities at each location. As a result, we did not include the following things:

- economic effect of potential chemical incidents,
- need for additional roads or bridges for evacuation, or
- residual value of the facility after closure.

We did not attempt to measure the economic effect of any potential incidents at the facility, such as leaks or explosions, since the appropriate federal assistance would be authorized independently. We also did not assess whether additional roads or bridges would be needed for evacuation beyond those identified by FEMA under the CSEPP. However, we mention such items when communities brought them to our attention. Finally, we did not include in our computations the residual value of the facility after closure since we could not predict whether it would be returned to the community or retained as federal property.

## **II. METHODOLOGY**

This study involves measuring the incremental costs and benefits to the community associated with the construction and operation of the chemical demilitarization facility. If the incremental costs are greater than the incremental benefits, the federal government may consider providing funds to the local communities to offset the difference.

Examples of incremental costs are those incurred from additional police, fire fighters, schools, water treatment, and other public service facilities and activities needed as a result of the increase in population resulting from the facility. Incremental benefits arise from the increased tax revenues realized by the local communities.

The two basic methodological tracks we could have taken to estimate these costs and benefits were (1) to conduct a case study at each of the eight sites and (2) to use economic models. Due to the strict 4-month time allowance for the study, we felt the case study approach was impractical. Therefore, we employed an economic model as our principal analytical tool and used a separate model to provide a cross-check. We did use case study methods to learn about externalities in each region in order to fulfill the sixth legislative criterion concerning other factors that the Secretary of Defense might consider appropriate in deciding whether a community should receive aid.

### **A. ECONOMIC MODELS**

IDA selected the Regional Economic Models, Inc. Policy Insight Model (commonly known as REMI) as the principal analytic tool for use in the assessments.<sup>6</sup> REMI is a regional econometric model consisting of a large number of linked mathematical equations. Each equation describes a detailed economic relationship. These equations are created using conventional economic theory to describe the structural relationships between variables. The parameters of each equation are calibrated to (estimated from) historical data.

---

<sup>6</sup> The model was developed by, and licensed from Regional Economic Models, Inc., Amherst, Massachusetts.

REMI has many features that make it one of the most powerful regional forecasting tools available.<sup>7</sup> Specifically, it has the following seven features often unavailable in other microcomputer-based regional models:

1. It is calibrated to local conditions using a relatively large amount of local data, which is likely to improve its performance, especially under conditions of structural economic change.
2. It has an exceptionally strong theoretical foundation.
3. It actually combines several different kinds of analytical tools (including economic-base, input-output, and econometrics), allowing it to take advantage of each specific method's strengths and weaknesses.
4. It allows users to manipulate an unusually large number of input variables and gives forecasts for an unusually large number of output variables.
5. It can generate forecasts for any combination of future years, providing users flexibility in analyzing the timing of economic effects.
6. It accounts for business cycles.
7. It has performed acceptably for a large number of users under diverse conditions.

One feature of REMI that makes it especially desirable for use in this study is the amount of visibility it provides into local government revenues and expenditures. Table 1 lists the individual revenue and expenditure variables. Not all of these variables, which are set to statewide averages, apply to every location since some of the categories of revenue and expenditures will not be applicable everywhere. For example, few local governments levy individual income taxes.

For purposes of this study, and on the advice of the model's developer, we used eight multi-regional versions of REMI. Thus, rather than examining the effects of the chemical demilitarization activity in isolation, we assessed those effects in the context of the regular commuting and trading relationships that exist between a relatively small area (the core county) and its larger, surrounding region (counties contiguous to the core). REMI also produces estimates of the state's expenditures and revenues associated with the economic activity conducted within the core and the surrounding region.

---

<sup>7</sup> This description of REMI is drawn in large part from: Karen R. Polenske, Kelly Robinson, Yu Hung Hong, Xiannuan Lin, Judith Moore, and Bruce Stedman, *Evaluation of the South Coast Air Quality District's Methods for Assessing Socioeconomic Impacts of District Rules and Regulations, Vol. I: Summary of Findings*, Department of Urban Studies and Planning, Massachusetts Institute of Technology, May 1992, pp. 17–19.



**Table 1. REMI's Revenue and Expenditure Variables**

Local Government Revenues	Local Government Expenditures
Federal intergovernmental	Intergovernmental
State intergovernmental	Higher education
Property tax	Elementary and secondary education; libraries
General sales tax	Welfare
Motor fuel sales tax	Health
Alcoholic beverage sales tax	Transportation
Tobacco sales tax	Police, fire, correction
Public utility sales tax	Natural resources, parks, housing
Other sales tax	Sewerage, solid waste
Individual income tax	Administration and unallocatable
Corporate income tax	Interest on debt
Motor vehicle license fees	Utilities, transit
Other taxes	Insurance trusts
Education charges	
Other charges and revenues	
Utility and liquor store revenues	
Unemployment compensation	
Employee retirement	

To assess the effects of a specific chemical demilitarization facility on a local economy, we generated two forecasts. The first, a *control* forecast, was a prediction of what the future economic behavior of the core county, the region, and the state would look like in the absence of a chemical demilitarization program. The second was a *simulation* in which we changed the relevant policy variables (principally, government expenditure and employment) in the model in order to estimate the economic effect of the facility, with emphasis on local government revenues and expenditures. In each case, the measure of interest is the difference (delta) between the two forecasts.

To validate the simulation results, we employed corresponding input-output multipliers from the Regional Input-Output Modeling System (RIMS) II. The Bureau of Economic Analysis, U.S. Department of Commerce, maintains these multipliers and made them available to us.

## **B. CONTROL FORECAST VERSUS SIMULATIONS**

As previously noted, each of the eight multi-regional models includes a REMI standard control forecast. These are year-by-year projections of the models' socio-economic variables, plus revenue and expenditures by the regional governments. The forecasts are based on a large number of factors and relationships, including changes in

population and economic activity over past years. With one exception, values in the standard control forecasts constitute the baseline against which we calculated the effect of the chemical demilitarization activity. The exception is that we have adjusted the models' population data to be consistent with the U.S. Census Bureau's counts from Census 2000. (See appendix C for more information on the handling of population data.)

With the population-adjusted control forecasts in hand, we conducted what are known in REMI terminology as *policy simulations*. For each region, we augmented the control data with the year-by-year data on employment and expenditures for construction and equipment associated with the chemical weapons destruction activity. (Again, see Appendix C for details.) This new activity led to changes in revenue and expenditures at the regional and state levels. These changes, the observed deltas, constitute the estimated effect of the activity in question. Thus, for each site, we present the REMI results for the core county alone, for the core county plus its surrounding region, and for the state.<sup>8</sup> Note that the state numbers presented in this report represent an estimate of the state expenditures and revenues associated only with the economic activity conducted in the core and the surrounding region, and not the true statewide economic effect.<sup>9</sup>

We noted in Chapter I that the simulation would be carried out over 35 years. A second temporal decision that we were required to make during the study had to do with the total duration of the destruction process at each site. As noted previously, the Chemical Weapons Convention mandates the destruction of all chemical weapons by April 2007. When this report was being written, the Department of Defense planned to meet this deadline at all sites. However, this treaty-defined deadline, which allowed for a total of 10 years from the 1997 entry-into-force date, is not necessarily consistent with current engineering estimates.

In recognition of this factor, we computed two sets of economic effect estimates. For one set, we used the current DoD schedules at each site, and for the other, we added 3 years to each site's current schedule to allow for schedule slips as well as to understand the general effect of longer schedules on the net economic effects. For consistency, we also extrapolated an additional three years of residual economic activity, resulting in a 38-year modeling interval.

---

<sup>8</sup> In cases where the surrounding area is in more than one state, the results are for both states combined.

<sup>9</sup> Because the core counties and their surrounding regions contain nearly all of the economic activity associated with the facilities, the total effect on the state would not differ greatly from that reported here.

## C. DATA USED TO DRIVE ECONOMIC MODELS

Two major drivers of any economy are population and employment. IDA obtained job counts associated with construction and operation of the chemical demilitarization activities at each site we visited. Table 2 lists the functions of the organizations from which IDA collected employment data related to chemical demilitarization. It also indicates whether or not the data were included in our estimates. Although some of the listed functions are outside the scope of the study, the organization's employees for those functions are sometimes assigned to demilitarization tasks.

**Table 2. Organizations That Contributed Employment Data**

Organizations and Related Functions	Included
Program Manager for Chemical Demilitarization (PMCD):	
Chemical Stockpile Disposal Program (CSDP)	Yes
Non-Stockpile Chemical Materiel Product (NSCMP)	Yes
Alternative Technologies	Yes
Chemical Depot Activity, Soldier and Biological Chemical Command (SBCCOM):	
Storage	No
Movement to Disposal Facility	Yes
Chemical Stockpile Emergency Preparedness Program (CSEPP) (on-post)	No <sup>a</sup>
Depot Support to:	
PMCD (Reimbursable Work)	Yes
Chemical Activity (Reimbursable Demilitarization Related Work)	Yes

<sup>a</sup> The cost of emergency preparedness is another component of the possible financial effect of chemical demilitarization activities. FEMA has already begun the CSEPP for off-post communities that addresses emergency preparedness and provides the required resources.

In order to obtain consistent employment and spending data at all sites, IDA developed and used a data collection template. We structured the template to capture data on employment (federal, state, and civilian), demographics of the workers, and spending by phase (i.e., construction, systemization, operation, and closure) and by year. Figure 2 shows the template we used.

## D. DATA COLLECTED THROUGH MEETINGS AND INTERVIEWS

In addition to data on employment, spending, and demographics, IDA conducted over 50 meetings during visits to the various sites to ascertain special circumstances that are either hard to quantify or not likely to be apparent to researchers unfamiliar with the local community. During the course of these meetings, the study team met with over 250 local elected officials, economic development officials, business leaders, and concerned citizens. Appendix A lists all the meeting participants.

<b>Personnel Associated with the Chemical Weapons Demilitarization Program</b> Year 1 begins with the receipt of the Resource Conservation and Recovery Act permit. Please provide the data through official closure of the facility.														
Source of Data (include your TDA / organization personnel or contractors directly associated with and reimbursed by the Chem Demil mission )														
Point of contact (please select the organization for which you work)										Phone: _____		Email: _____		
PMCD <input type="checkbox"/>	Systems Contractor <input type="checkbox"/>		Chemical Activity (SBCCOM) <input type="checkbox"/>				Depot <input type="checkbox"/>		Other (Please specify): _____					
	FY 1	FY 2	FY 3	FY 4	FY 5	FY 6	FY 7	FY 8	FY 9	FY 10	FY 11	FY 12	FY 13	FY 14
<b>Construction Phase</b>														
Military Personnel														
Civilians														
Federal Government														
State/Local Government														
Contractors														
<b>Systemization Phase</b>														
Military Personnel														
Civilians														
Federal Government														
State/Local Government														
Contractors														
<b>Operations Phase</b>														
Military Personnel														
Civilians														
Federal Government														
State/Local Government														
Contractors														
<b>Closure/Shutdown Phase</b>														
Military Personnel														
Civilians														
Federal Government														
State/Local Government														
Contractors														
<b>Employee Demographics: Please estimate the percentage of workers that reside in the counties listed below:</b>														
"County Name"														
All other contiguous Counties														
<b>Estimated construction cost of the Demilitarization Facility:</b>														
Labor:														
Material:														
Percentage of construction materials purchased in "County Name"														
Percentage of construction materials purchased in all other contiguous counties														
Remarks:														

**Figure 2. Data Collection Template**

## E. A NOTE ABOUT BLUE GRASS AND PUEBLO

At the time of this study, the technology to be used for destruction of the chemical weapons had yet to be decided for Blue Grass and Pueblo. Both incineration and alternative technologies for the destruction of the assembled weapons were being considered at these sites.<sup>10</sup> Since the number of workers and construction costs could vary significantly depending on which method of destruction is chosen, we decided to report two separate estimates of the economic effect for the Pueblo site. (However, in keeping with our rule of avoiding underestimation of community compensation, our conclusions are based on only the more adverse result.) To estimate the cost and schedule of the incineration option, we used the Pine Bluff site as an analogue to derive estimates of workers and spending.<sup>11</sup> For the alternative technology option we used resource estimates based on a technology referred to as chemical treatment (hydrolysis with H<sub>2</sub>O) followed by biodegradation.

<sup>10</sup> Public Law 102-208 (1997) requires the Department of Defense to identify and demonstrate not less than two alternatives to incineration for disposal of assembled chemical weapons. The Assembled Chemical Weapons Assessment (ACWA) office was established to carry out this direction. The ACWA office provided construction and operations costs associated with these alternative technologies.

<sup>11</sup> Om Handa, MCD Staff, telephone conversation with John J. Cloos, June 12, 2001.

In the case of Blue Grass, we used the Anniston site as an incineration technology analogue to derive the estimates of workers and spending needed by the model.<sup>12</sup> At the time of this report, no estimate for an alternative technology at Blue Grass was identified. Therefore, only the incineration option was simulated for Blue Grass. In the next chapter, we discuss in detail the process of estimating these inputs.

## F. STUDY CRITERIA AND IDA'S APPROACH

Table 3 maps the six study criteria enumerated in the National Defense Authorization Act for Fiscal Year 2001 to the study methods IDA employed. The third column describes the data used to drive the models. For criteria 1 through 4, we used economic models to assess the economic effect.

**Table 3. Study Criteria and Approach**

Study Criteria	Assessment Approach	Data Used
1. Effect of change in population on the community	Employ REMI and RIMS II to estimate additional burden (costs) and benefits (revenues) <sup>a</sup> that accrue to the county and state governments	Estimates of jobs and facility costs associated with construction, systemization, and operation of the chemical/demilitarization facility; data provided by the Army and its contractors
2. Possible temporary nature of population change	Employ REMI and RIMS II	Estimate of the phasing of the construction, systemization, and operation jobs associated with the chemical/demilitarization facility
3. Initial infrastructure capitalization to support population change	Employ REMI	Endogenous to REMI, which estimates the additional amount of infrastructure required to support the population change
4. Costs of infrastructure operations	Employ REMI	Endogenous to REMI, which estimates the additional cost of fire, police, etc., required to support the population change
5. Costs of emergency evacuation routes	Identified by communities—requires subsequent validation by Secretary of Defense or other agencies (e.g., FEMA) <sup>b</sup>	Communities and independent expert review
6. Other factors	Identified by communities—requires subsequent validation by Secretary of Defense or other agencies (e.g., FEMA) <sup>c</sup>	Communities and independent expert review

<sup>a</sup> The absence of community revenues from property taxes on military facilities is accounted for in REMI in computing net revenues and expenditures.

<sup>b</sup> These costs include historical costs and estimated future costs incurred that are both reasonable and necessary (as determined by the CSEPP process).

<sup>c</sup> Local communities raised the following issues during the study team visits that apply only to the storage of the chemical stockpile: environmental effects; perception of communities as dumping grounds, adverse business relocation decisions; and perception of reduced quality of life.

<sup>12</sup> Kevin Gildner, PMCD staff, telephone conversation with John J. Cloos, May 20, 2001.

The next chapter presents the results of applying the methodology to each of the eight chemical demilitarization sites.

### III. RESULTS

This chapter begins with general description of REMI's simulation results. Following that, the specific results for each of the eight sites are discussed in turn. For each site, we describe the composition of the region, the period of the analysis, the simulated effect, and other noteworthy considerations.

#### A. GENERAL RESULTS

The results of the analysis using the DoD demilitarization schedules suggest that the communities surrounding six of the eight facilities will sustain a negative economic effect, regardless of whether the community is construed to mean only the core of the region or the core plus all its contiguous counties. The negative effects at the cores range from below \$1 million to \$24 million with the average being about \$6 million (discounted constant 2001 dollars).<sup>13</sup> The negative effects at the larger regions are somewhat lower, averaging closer to \$5 million. The smaller average effect for the regions including the contiguous counties means that, in general, the contiguous counties alone (not including the core) benefit slightly and therefore offset a portion of the losses sustained by the core county of each region. The communities surrounding the two other facilities, Pine Bluff and Umatilla, will likely experience moderately positive effects from the chemical demilitarization activities, both at the core and for the region as a whole. At the state level, the results are more consistent. The model predicts a considerable positive economic effect for the states, averaging over \$32 million per facility. All of these numbers should be understood in the context of the much higher levels of total investment.<sup>14</sup>

At first glance, these results are surprising. One would expect that the infusion of a billion dollars into a region would be economically advantageous to the area. If that were not true, why were the communities we observed trying so hard to attract business to their

---

<sup>13</sup> The ACWA approach at Pueblo turned out to have a greater negative effect than the incineration process there, so we used the ACWA results in these conclusions.

<sup>14</sup> We did not conduct a full sensitivity analysis of REMI that would illuminate the precision of the results in the face of billion-dollar investments. Partial analyses conducted in this vein suggest the results are not as precise as they appear (i.e., the error bounds of the input are large enough to imply a confidence interval of a few million dollars for any of these results).

jurisdiction? Closer inspection suggests the negative effect is due to the rather sharp business cycle induced by the chemical demilitarization projects in these localities. The rapid infusion of construction expenditures is followed by several years of chemical demilitarization jobs that pay more than local workers are normally paid. In general, all regions and states enjoy net gains during this period. However, these benefits end quickly when the facility is closed. The temporary, higher-paying chemical demilitarization jobs turn out to be detrimental to most areas in the long run because they have inflationary effects on labor rates and real estate prices that cannot be sustained by long-term increases in per-capita income. Further, investments made to accommodate the additional population must be amortized over the declining population following closure. Compared with most economic investments of this magnitude, the life cycle of the demilitarization activity is unnaturally brief, less than a decade at most locations. Indeed, a community might not choose to host the construction of a complex, billion-dollar facility that will operate for only a few years and then close.

Closer inspection of the model results at the state level reveals that revenues begin increasing immediately, mainly from federal transfers and individual income taxes. All other forms of taxes also increase. On the expenditure side, transfers to the affected counties tend to offset the increase in federal transfers, but increases in other expenditures—the largest going to higher education—remain well below the gains from taxes and other revenue sources. The net result is that the states enjoy positive fiscal benefits that are usually large relative to the local effects, although not especially large relative to the total state budgets.

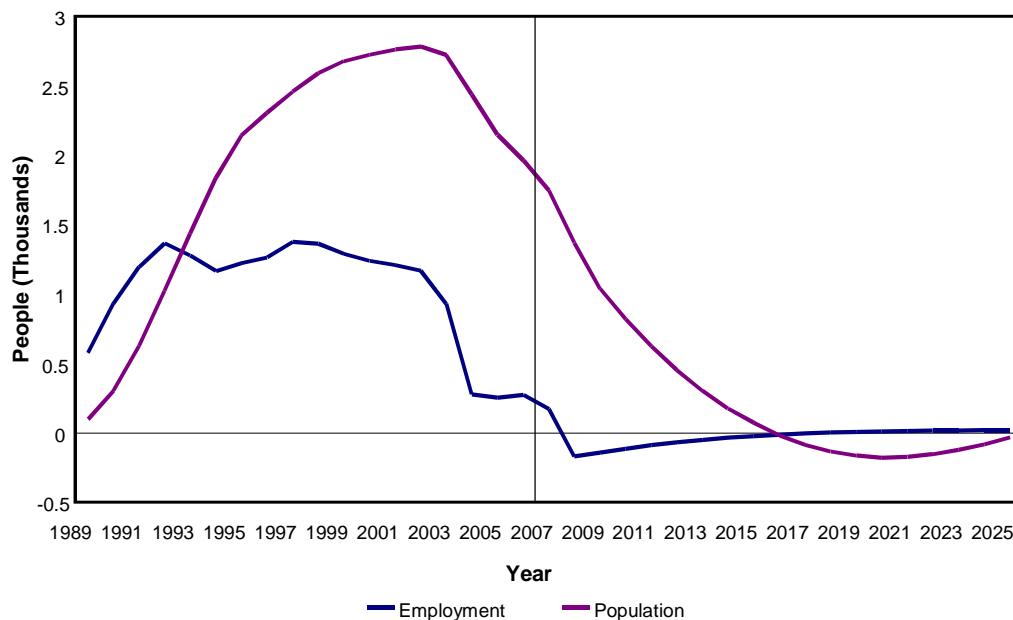
At the local level, there is a greater balance between the increases in revenue and expenditures. As noted above, the counties receive higher transfer payments from state governments, as well as additional taxes and other sources of local revenue. However, unlike the situation at the state level, local expenditures must rise at least as fast as these revenues, particularly to accommodate increased funding for elementary and secondary education. Therefore, unlike at the state level, the local net effect is often negative, with only two of the eight regions coming out financially ahead.

## **1. Why Some Regions Experience Net Gains and Others Net Losses**

One of the characteristics that distinguishes the two regions that enjoy a net economic gain from the six regions that experience losses is the number of people who stay versus leave after the new jobs have ended. In regions that experience net economic losses, workers and their families tend to stay after the facility is closed, whereas regions



tend to retain their gains if workers leave quickly after the facility closes. We project that in the Deseret region, for example, families will stay in the region after the chemical demilitarization employment ends. In Figure 3, we plotted the change in employment and population attributable to the Deseret facility over time as estimated by the REMI model. The vertical line denotes the scheduled closure date. The difference between the two lines shows that the population (upper line) exceeds the number of jobs (lower line) for several years following closure.

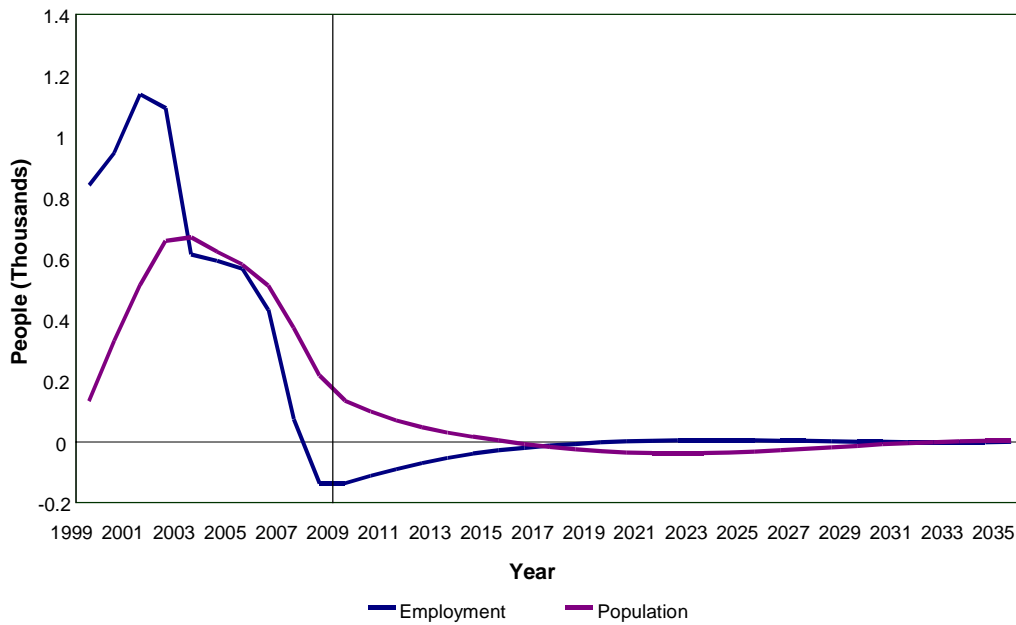


**Figure 3. Deseret Employment and Population Projections**

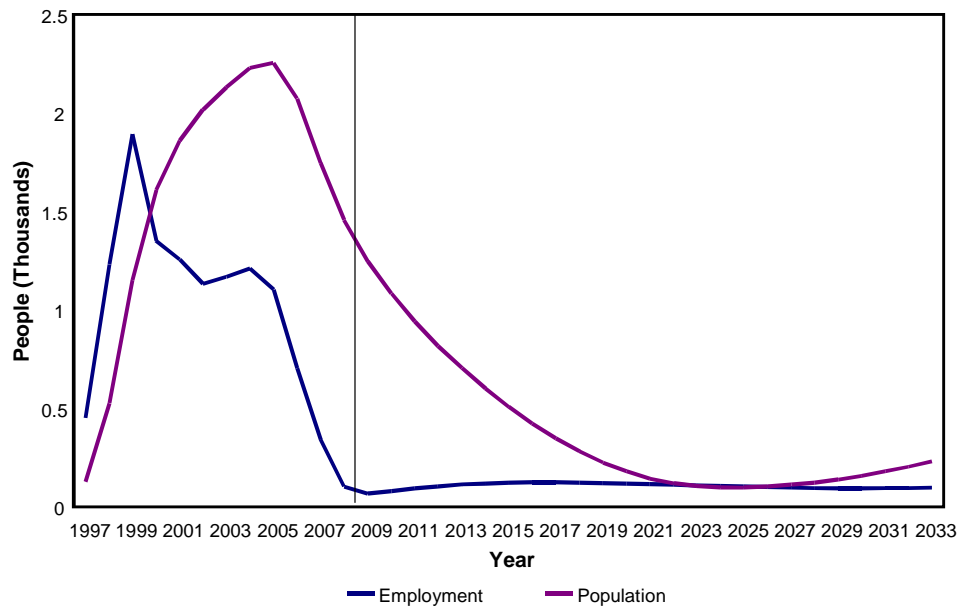
Contrast that situation to the one in Pine Bluff, depicted in Figure 4. For the Pine Bluff region, the difference between the two lines is relatively small. This resiliency to employment demand suggests that workers are quick to depart the area as the facility winds down and then finally closes. Thus, these workers and their families do not burden the regions with requirements for education, unemployment compensation, and other services.

A third situation, illustrated by the results for Umatilla, occurs when families do not leave quickly after a facility closes, but rather are able to find other jobs in the area. Figure 5 plots the employment and population for Umatilla County during and after the demilitarization activities. Notice that the decline in employment leading up to and following closure stabilizes at around 100 extra jobs instead of dropping below the control prediction, as was the case in the previous two illustrations. The contribution of this sustained employment to the local revenue helps offset the costs incurred by the temporary excess in population. This

illustrates that some level of sustained economic activity following a temporary surge can mitigate the long-term negative effects that otherwise can occur.



**Figure 4. Pine Bluff Employment and Population Projections**



**Figure 5. Umatilla Employment and Population Projections**

## 2. Caveats

We have reported our results directly from REMI, and recommend that the following considerations be kept in mind when interpreting the numbers. First, the results are conditioned on sets of employment, expenditure, and schedule input that are estimates—some quite preliminary—and subject to change over time. Second, the model (unlike the affected communities) is unaware that the rapid expansion due to chemical demilitarization activities is intended to be of a short-term nature. In other words, there is some artificiality associated with the “business cycle” that follows the initiation of construction, and communities may decide to respond more appropriately than the model predicts they will. Third, there is a degree of error embedded in the model’s estimating factors and equations since they have been determined from empirical data. The exact amount and consequence of those errors cannot be precisely known. Finally, as a general rule, any projections into the future carry with them an inherent degree of uncertainty and these results are certainly no exception to that rule.

## 3. Corroboration

As partial corroboration of our results, we employed the RIMS II multipliers (the Regional Input-Output Modeling System maintained by the U.S. Department of Commerce’s Bureau of Economic Analysis) to cross check the output from REMI. Although we were not able to construct a complete economic simulation with RIMS II, we were able to compare job creation estimates in order to validate that portion of our analysis.<sup>15</sup> To do this, we used the construction industry multipliers in RIMS II to simulate military spending on structures. We computed the construction employment effect produced by RIMS II and compared it to the corresponding employment delta estimated by REMI. For example, the final-demand multiplier for Tooele County, UT, where the Deseret facility is located, is 9.8 jobs for each \$1 million (in 1997 prices) of new construction. Over the five-year construction period in Tooele, average annual spending on structures was \$55.8 million (in 1997 prices). Thus, the RIMS II final-demand multiplier indicates that there was an average annual increase of 547 jobs in that industry. The

---

<sup>15</sup> RIMS II consists of sets of location-specific inter-industry multipliers. There are both final-demand and direct-effect multipliers. To use either requires knowledge of changes that will occur in 38 industry groupings (transportation, wholesale trade, retail trade, etc.). Thus we would first have to estimate those changes, and then after applying the multipliers, estimate the effect on government revenue and expenditures. (RIMS II contains neither public-sector nor population modules.) Moreover, inter-industry multipliers are static constructs that are not well suited for analyzing the year-by-year dynamics of construction, systemization, operations, and closure of military facilities.

corresponding REMI estimate was very similar, at 558 jobs.<sup>16</sup> Upon verifying this correspondence, we made no further use of the RIMS II multipliers.

#### **4. Other Considerations**

In addition to the quantification of economic effects, Congress also requested that the study address, “such other factors as the Secretary [of Defense] considers appropriate.” During our visits to the communities surrounding the eight chemical demilitarization facilities, various local government and community groups asserted that their chemical stockpile and its subsequent destruction have had or will have negative economic consequences for their areas. We collected those comments and summarized those that were common to all or most sites below.

- Roads designated as emergency evacuation routes are not adequate and have not been recently reviewed by FEMA. Heavy truck usage during the chemical demilitarization phase could cause excessive damage to local roads.
- Businesses may leave or not enter the area due to the negative perception of communities where chemical stockpiles are housed. The lack of businesses would have an adverse effect on real estate values in the immediate vicinity of the depots.
- The Army and local communities need more integrated planning to ensure any new infrastructure (e.g., water, roads, sewage) required by the Army could be effectively used after the activities are closed.
- The chemical demilitarization program generally results in local infrastructure costs exceeding local revenues because the federal government does not pay property taxes and DoD does not provide any payments in lieu of taxes, as does the Department of Energy, for example.
- The chemical demilitarization program creates numerous temporary well-paying jobs that cause local wage rates to increase, making it more difficult for local businesses and governments to compete in the labor market. In this way, the chemical stockpile activities tend to create a “boom-bust” economy.
- In those communities where the depots would be closed after chemical destruction was completed, it is economically important that the depots be transferred to local ownership.

---

<sup>16</sup> The similarity of those two numbers is probably due in large part to the fact that REMI incorporates much of the same input-output data contained in RIMS II.

- The costs of operating and maintaining FEMA-provided equipment after the stockpiles are destroyed will be high and may not be affordable if funded exclusively by local governments.
- In most cases, federal funding is not provided to reimburse the local governments for the time local officials spend on chemical demilitarization activities.

We make no judgments here about the validity of these claims because they were outside both the scope of this study and our areas of expertise. However, the study team collected supporting documentation in case the Secretary of Defense or other appropriate federal officials determine that further investigation is warranted into these circumstances. In some cases, the documentation includes cost estimates to remedy specific problems (e.g., costs to build a new road) that were provided by the communities involved.

Additional site-specific concerns are detailed in the individual site results presented in the sections that follow.

## **B. ANNISTON ARMY DEPOT (ALABAMA)**

### **1. Composition of the Region**

Figure 6 shows the region surrounding Anniston Army Depot. The core of the region is Calhoun County, where the depot is located. The surrounding region is made up of Cherokee, Cleburne, Talladega, St. Clair, and Etowah counties in Alabama. Results of Census 2000 show the populations of the core and surrounding region to be 112,249 and 286,633, respectively.



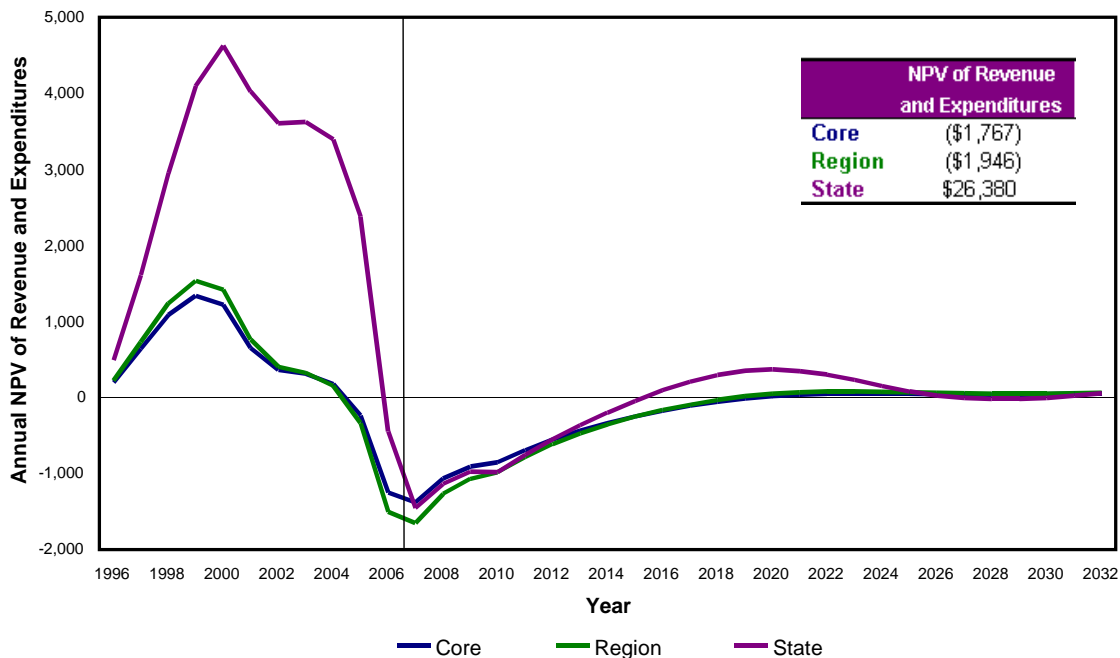
**Figure 6. Region Surrounding Anniston Army Depot**

## 2. Period of the Analysis

Construction began at Anniston in 1996. The DoD schedule calls for operation to be completed by the end of 2005.

## 3. Simulated Effect

Figure 7 indicates a large positive fiscal effect at the state level (\$26 million in dollars discounted to 2001 as the base year).<sup>17</sup> At the core of the region, Calhoun County, the simulation shows the total change in expenditures slightly exceeding the total change in revenue, producing a net negative effect of \$1.8 million over the 35-year period. For the core and surrounding counties combined, the net negative effect is \$1.9 million, indicating that there is an additional net loss of 0.1 million in the surrounding counties alone.



**Figure 7. Anniston Region's Annual Net Revenues: DoD Schedule**

<sup>17</sup> We chose to display all results in net present value (NPV) dollars discounted to 2001, although other methods of quantifying a stream of past and future economic effects could be used. One could argue, for example, to use nominal (current year) dollars because compensations are often denominated on that basis. Or, a case could be made for showing the results in constant year dollars that only remove the effects of inflation. While we considered discounting appropriate—as does Office of Management and Budget Circular No. A-94 *Guidelines and Discount Rates For Benefit-Cost Analysis of Federal Programs*, October 1992 to support decisions regarding investment alternatives—we used a very conservative discount factor that we felt represented the lowest possible cost of money to the communities. We show the details of the calculation of this discount factor in Appendix C.

For each region, we also ran a simulation that included 3 additional years of operation to allow for schedule slips, as well as to understand the general effect of longer schedules on the net economic effects. These results, which were computed for correspondingly extended 38-year intervals, are shown along with the results for the DoD schedules in Table 4, which appears in the next chapter.

For the Anniston region, there is essentially no difference for either the core county or the larger region including the surrounding counties when 3 additional years of operation are added to the simulation. At the state level, the longer schedule results in nearly \$10 million of additional positive economic effect.

#### **4. Other Considerations**

The respondents we met with during the case study of the region raised the following issues that are not factored into the preceding quantitative results:

- The region has not participated in any significant industrial growth in the last several years, partially due to the presence of the chemical stockpile and chemical demilitarization activities. (This came up during Meeting 6 of our visit to Anniston—see Appendix A for a list of participants at each meeting.)
- Public safety is a concern, particularly as it relates to the lack of adequate public roads for evacuation and the shortfall in facility over-pressurization.<sup>18</sup> (This also came up during Meeting 6.)
- The region was given \$10 million when Fort McClellan was closed; however, no major industry has been attracted to the area since the announcement of the incineration process for destruction of the stockpile located at the Anniston Chemical Activity. (This came up at Meeting 8.)
- There is a problem with maintaining emergency capabilities that are still needed after the chemical activity is closed. The government should assume some funding responsibility during the post-stockpile period (Meeting 9).

### **C. BLUE GRASS ARMY DEPOT (KENTUCKY)**

#### **1. Composition of the Region**

Figure 8 shows the region surrounding Blue Grass Army Depot. The core of the region consists of Madison County, where the depot is located. The surrounding region is

---

<sup>18</sup> Schools and other public buildings can be equipped with special ventilation systems that maintain a slight positive pressure so their occupants can be better protected from any accidental contamination of the outside air.

made up of Clark, Estill, Jackson, Rockcastle, Garrard, Jessamine, and Fayette counties in Kentucky. Results of Census 2000 show the populations of the core and surrounding region to be 70,872 and 392,873, respectively.



**Figure 8. Region Surrounding Blue Grass Army Depot**

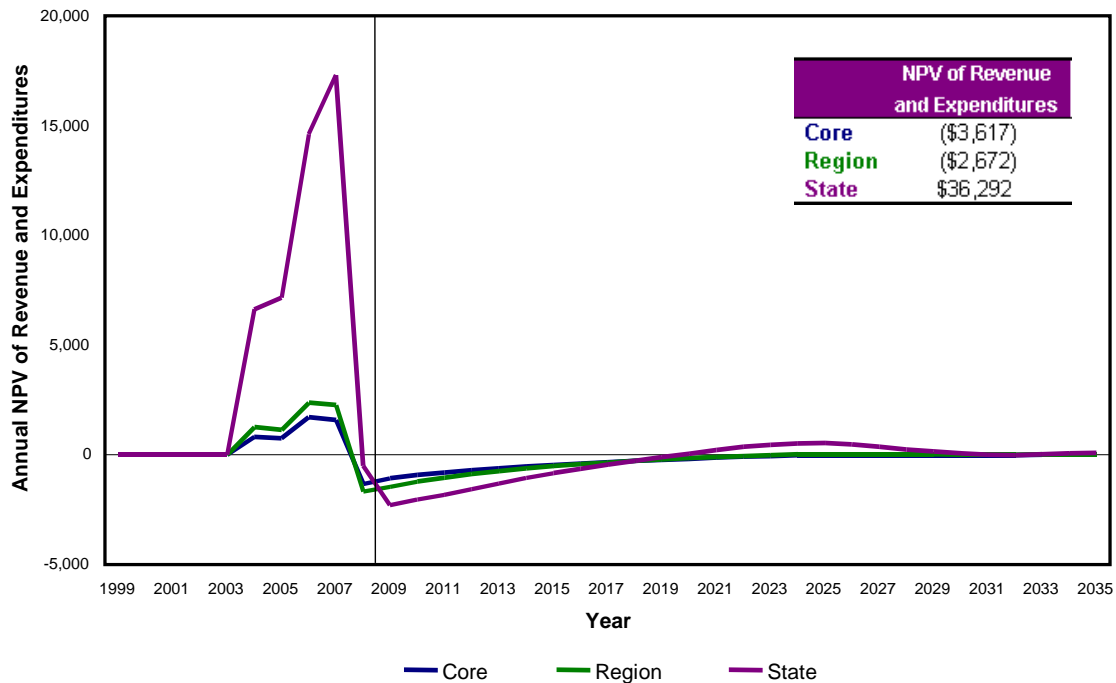
## **2. Period of the Analysis**

Because the chemical destruction method to be used at Blue Grass has not yet been determined, a specific DoD schedule for Blue Grass was not available. To provide a proxy for the missing information, we imposed the schedule of its closest analogue, the Anniston Army Depot. By shifting events into the future, we estimated that construction would begin at Blue Grass in 2003. However, because the assumed schedule calls for operations to be completed by the end of 2007, we constrained the operation phase to end by this date.

## **3. Simulated Effect**

As Figure 9 indicates, there is a large positive fiscal effect at the state level (\$36 million). At the core of the region, Madison County, the simulation shows the change in expenditures exceeding the change in revenue by a modest amount, producing a negative effect of \$4 million over the 35-year period. For the core and surrounding counties combined, the negative effect is about \$1 million less than in the core, implying that there is an offsetting \$1 million net positive effect for the surrounding counties when considered alone.





**Figure 9. Blue Grass Region’s Annual Net Revenues: DoD Schedule**

The regional results are only marginally improved when 3 years are added to the operation phase and the simulation is carried out for 38 years. Again, the state would enjoy additional net revenue under the extended schedule, in this case almost \$3 million more, bringing the total positive effect at the state level to \$39 million. Since the extended schedule results in improvements in net effect, we felt we did not have to determine a more realistic schedule in order to avoid underestimating an appropriate regional compensation.

#### 4. Other Considerations

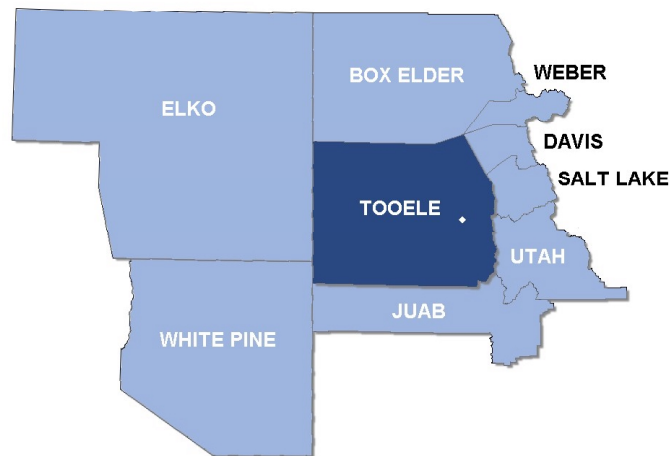
The respondents we met with during the case study of the region raised the following issues that were not factored into the preceding quantitative results:

- Any infrastructure-related facilities (e.g., electric sub-station, sewer, etc.) built on the depot to support chemical demilitarization activities should be located as close as possible to the surrounding communities to facilitate subsequent use by the local community. (This came up during Meeting 3 of our visit to Blue Grass—see Appendix A for a list of participants at each meeting.)
- The city of Richmond, which touches the Blue Grass Army Depot on three sides, tries to be a good neighbor by including depot infrastructure needs in its planning processes. (This came up during Meeting 4.)

## **D. DESERET CHEMICAL DEPOT (UTAH)**

### **1. Composition of the Region**

Figure 10 shows the area surrounding Deseret Chemical Depot. The core of the region is Tooele County, where the depot is located. The surrounding region is made up of the following counties: Box Elder, Weber, Davis, Salt Lake, Utah, and Juab in Utah and Elko and White Pine in Nevada. Results of Census 2000 show the populations of the core and surrounding region to be 40,735 and 1,807,905, respectively.



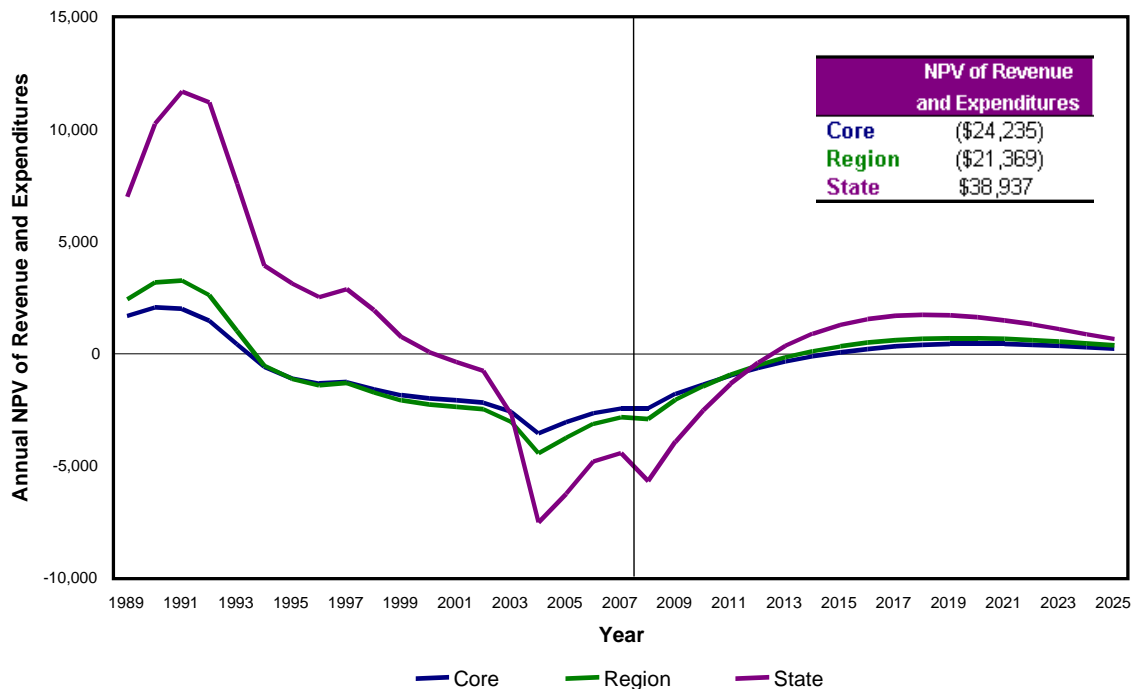
**Figure 10. Region Surrounding Deseret Chemical Depot**

### **2. Period of the Analysis**

Construction began at Deseret in 1989. The current schedule calls for operation to be completed by the end of 2003.

### **3. Simulated Effect**

As indicated in Figure 11, there is a sizeable positive fiscal effect at the state level of \$39 million. At the core of the region, Tooele County, the simulation shows the change in expenditures exceeding the change in revenue by a large amount, resulting in a negative effect of \$24 million over the 35-year period. For the core and surrounding counties combined, the negative effect shrinks to about \$21 million, implying that there is an offsetting \$3 million net positive effect for the surrounding counties when considered alone.



**Figure 11. Deseret Region’s Annual Net Revenues: DoD Schedule**

The Deseret region shows the largest negative effect among all the sites by a substantial margin. We suspect that the fact that Tooele County is highly residential means that the effect of the temporary economic activity on prices, property values, and government services is more pronounced than in most or all of the other regions.

An additional 3 years of operation only exacerbates the regional losses to \$26 million for the core county alone and to \$23 million for the entire region. Conversely, the state’s benefits rise by \$6 million to \$45 million.

#### 4. Other Considerations

The following issues were not factored into the preceding quantitative results.

- We did not consider or factor into these results the user fees paid by the Army for waste dumping in the community. Expectations are that Tooele Chemical Agent Disposal Facility will pay more than \$12 million in fees over the life of the chemical weapon disposal project.<sup>19</sup> (This came up during Meeting 1 of our visit to Deseret—see Appendix A for a list of participants at each meeting.)

<sup>19</sup> This estimate is taken from a press release from EG&G Defense Materials, Inc., “State of Utah Researchers Report EG&G Boosts Tooele County Economy in Big Way,” dated 1 September 1998.

- Some businesses have allegedly avoided the area (e.g., Wal-Mart), or have left the area (Morton Salt), because of the stigma of the chemical weapons stockpile or demilitarization activity. (This came up during Meeting 2.)
- Tooele is the fastest growing county in Utah but is more residential than industrial, resulting in a smaller tax base. Many workers live here and work in the “Wasach Front” (the more commercial three counties to the east, including the cities of Salt Lake City and Ogden). The migration leading to this imbalance happened over the last 5 to 7 years. The most recent growth is largely due to people living here but working in Salt Lake City. Residential taxes alone do not cover the increased requirement for services. Business investment is needed to offset these losses. (This also came up during Meeting 2.)
- The Tooele Valley medical center is losing money and costs the county \$2 million a year to keep open. Tooele negotiated a \$1-million-a-year payment from the Army on the theory that the incinerator posed enough of a hazard to warrant keeping this center open in order to avoid a 30-mile trip to Salt Lake City to reach a hospital. These payments, which will stop when a new local hospital is built in a few years, were not factored into the net effect (Meeting 2).

## **E. EDGEWOOD CHEMICAL ACTIVITY (MARYLAND)**

### **1. Composition of the Region**

Figure 12 shows the area surrounding Edgewood Chemical Activity. The core of the region is Harford County, where the chemical activity is located. The surrounding region is made up of Baltimore and Cecil counties in Maryland and York and Lancaster counties in Pennsylvania. Results of Census 2000 show the populations of the core and surrounding region to be 218,590 and 1,692,652, respectively.



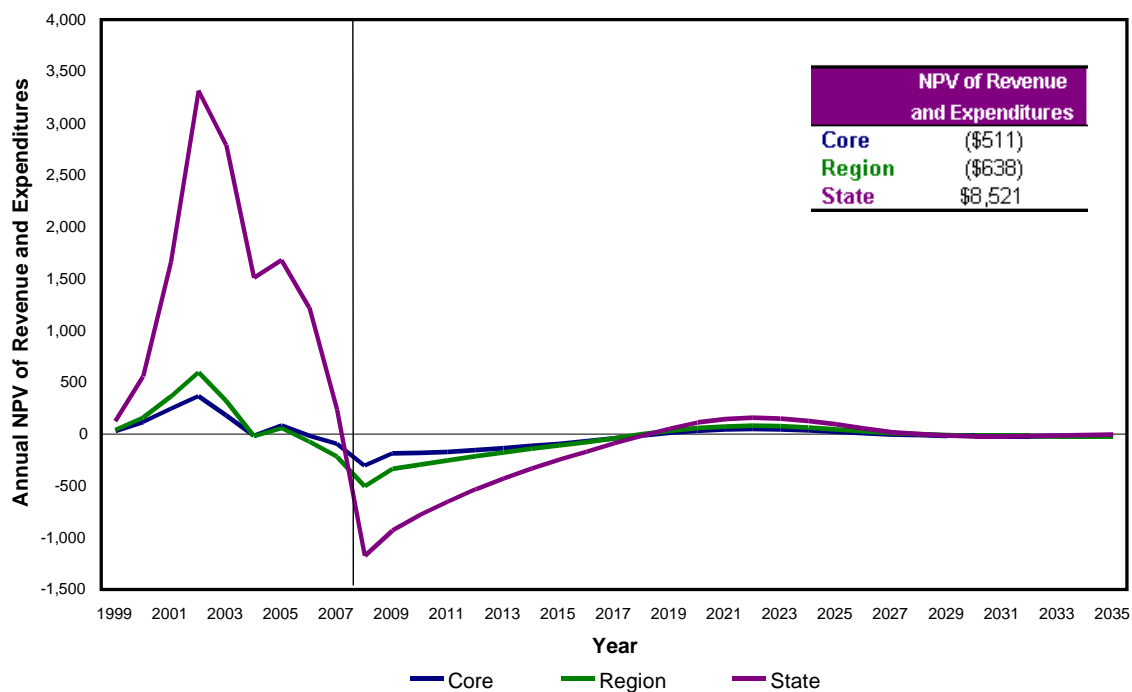
**Figure 12. Region Surrounding Edgewood Chemical Activity**

## 2. Period of the Analysis

Construction began at Edgewood in 1999. The current schedule calls for operations to be completed by the end of 2006.

## 3. Simulated Effect

As Figure 13 indicates, there is a moderate positive fiscal effect at the state level (\$9 million in discounted dollars, making this the lowest of any state effect). At the core of the region, Harford County, the simulation shows the change in expenditures only slightly exceeding the change in revenue, producing a negative effect of less than \$1 million over the 35-year period. For the core and surrounding counties combined, the negative effect is essentially the same, indicating that the surrounding counties break even economically over this period.



**Figure 13. Edgewood Region's Annual Net Revenues: DoD Schedule**

The addition of 3 years to the above schedule improves the picture at all levels. The million-dollar losses to the core and the region become \$2 million gains. The benefits to the state also rise by over \$5 million producing a net gain of \$14 million.

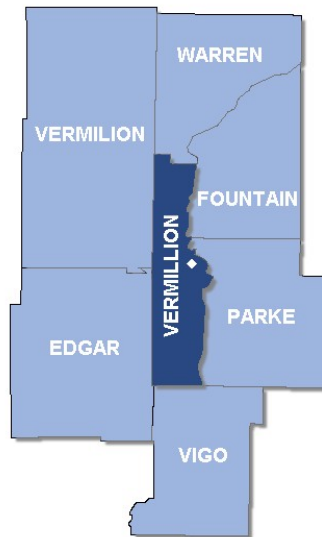
#### 4. Other Considerations

No other considerations were reported for the Edgewood region.

### F. NEWPORT CHEMICAL DEPOT (INDIANA)

#### 1. Composition of the Region

Figure 14 shows the area surrounding Newport Chemical Depot. The core of the region is Vermillion County, where the depot is located. The surrounding region is made up of Warren, Fountain, Parke, and Vigo counties in Indiana and Edgar and Vermillion counties in Illinois. Results of Census 2000 show the populations of the core and surrounding region to be 16,788 and 253,085, respectively.



**Figure 14. Region Surrounding Newport Chemical Depot**

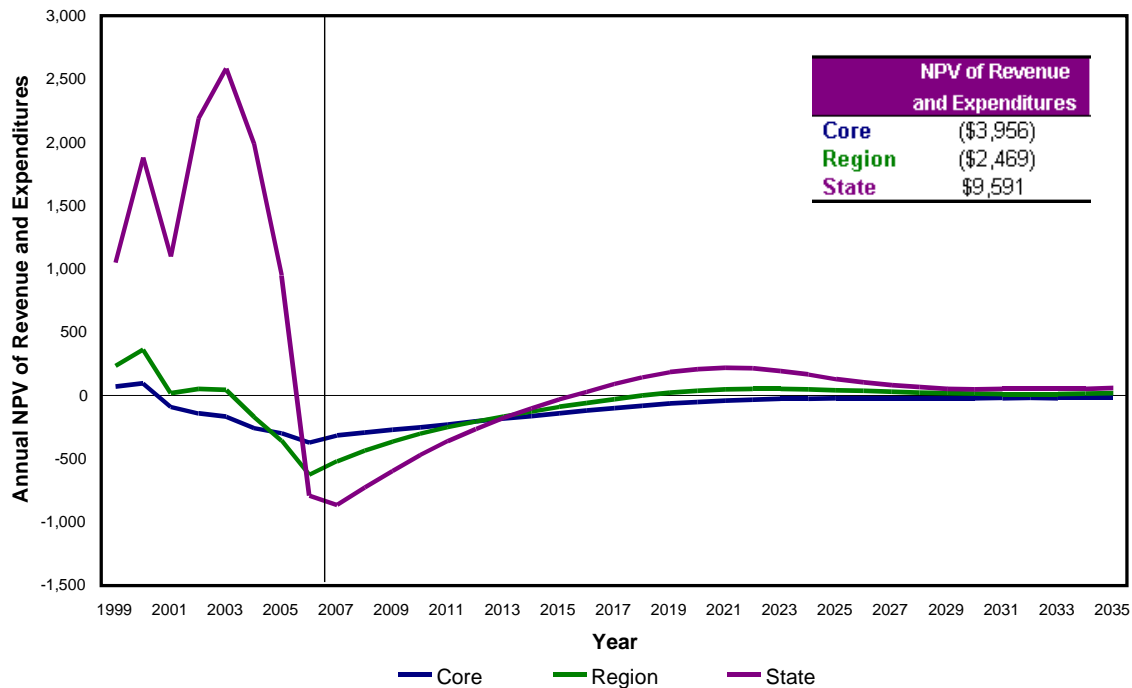
#### 2. Period of the Analysis

Construction began at Newport in 1999. The current schedule calls for operations to be completed by the end of 2004.

#### 3. Simulated Effect

As shown in Figure 15, there is a moderate positive fiscal effect at the state level (approaching \$10 million in discounted dollars). At the core of the region, Vermillion County, the simulation shows that the change in expenditures exceeds the change in

revenue, producing a negative effect of \$4 million over the 35-year period. For the core and surrounding counties combined, the negative effect is only \$2 million, indicating that the surrounding counties, when considered alone, enjoy a net gain of roughly \$2 million.



**Figure 15. Newport Region's Annual Net Revenues: DoD Schedule**

The effect of adding 3 years to the operation phase of the DoD schedule adds a burden of between \$0.5 million and \$1 million on both the core county and the region. Newport and Deseret are the only facilities where the extended schedule has an adverse effect on the regional net economic effect (see Table 4 later in the next chapter).

#### 4. Other Considerations

The following issues were not factored into the preceding quantitative results.

- Vermillion County's main concern is ownership of the depot after the facility closes—part of the depot is an excellent industrial site and strip annexation is possible in Indiana. (This came up during Meeting 3 of our visit to Newport—see Appendix A for a list of participants at each meeting.)
- Vermillion County wants to gain title to the depot (free of charge) for industrial development; the county does not presently seek any other economic help related to the chemical stockpile or its demilitarization. (This came up during Meeting 6.)

- Parke County is concerned that destroying chemicals on the depot will produce secondary waste that must be transported off-site via tankers, which will cause damage to the roads and carries the potential for accidents. (This came up during Meeting 4.)

## **G. PINE BLUFF ARSENAL (ARKANSAS)**

### **1. Composition of the Region**

Figure 16 shows the area surrounding Pine Bluff Arsenal. The core of the region consists of Jefferson County, where the arsenal is located. The surrounding region is made up of Lonoke, Arkansas, Lincoln, Cleveland, Grant, and Pulaski counties in Arkansas. Results of Census 2000 show the populations of the core and surrounding region to be 84,278 and 480,578, respectively.



**Figure 16. Region Surrounding Pine Bluff Arsenal**

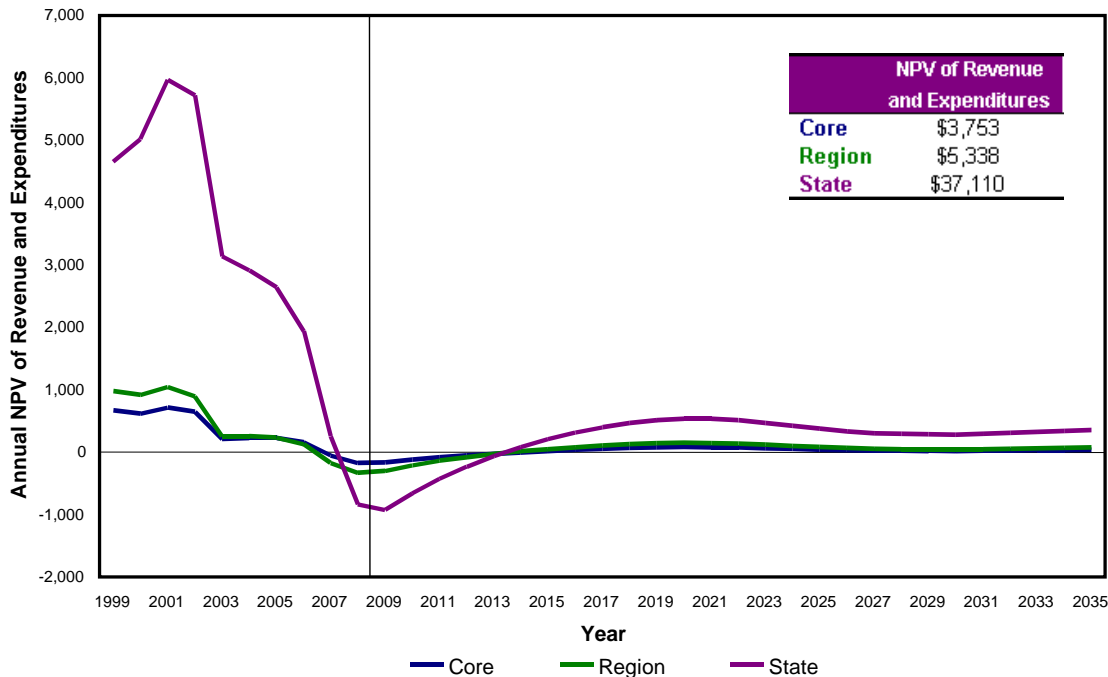
### **2. Period of the Analysis**

Construction began at Pine Bluff in 1999. The current schedule calls for operations to be completed by the end of 2006.



### 3. Simulated Effect

As Figure 17 indicates, there is a large positive fiscal effect at the state level (\$37 million in discounted dollars). There are also moderate positive effects of \$4 million and \$5 million respectively for the core, Jefferson County, and for the total region.



**Figure 17. Pine Bluff Region's Annual Net Revenues: DoD Schedule**

When 3 years are added to the DoD schedule, the state's estimated net revenues increase by \$9 million, while the already positive core and regional effects each increase by another \$2 million.

### 4. Other Considerations

The following concerns were not factored into the preceding quantitative results.

- Gravel Pit Road (about 4 miles of county road) extending from I-530 to Highway 365 is in disrepair because of heavy trucks transporting gravel from the sandpit to the chemical demilitarization site. Forcing trucks to use the state road would add considerable distance. The county has coordinated with the state to obtain a repair estimate of about \$800,000 per mile. (This came up during Meeting 5 of our visit to Pine Bluff—see Appendix A for a list of participants at each meeting.)
- People frequently reside in other counties because of the stockpile. Skilled workers expected to work at the demilitarization plant will likely leave the

area after the project is complete because of the lack of other industrial opportunities. (This came up at Meeting 5.)

## **H. PUEBLO CHEMICAL DEPOT (COLORADO)**

### **1. Composition of the Region**

Figure 18 shows the area surrounding the Pueblo Chemical Depot. The core of the region consists of Pueblo County, where the depot is located. The surrounding region is made up of El Paso, Lincoln, Crowley, Otero, Las Animas, Huerfano, Custer, and Fremont counties in Colorado. Results of Census 2000 show the populations of the core and surrounding region to be 141,472 and 621,562, respectively.



**Figure 18. Region Surrounding Pueblo Chemical Depot**

### **2. Period of the Analysis**

Since the method of chemical destruction at the Pueblo Chemical Depot has not yet been selected, no DoD schedule for the demilitarization activities there was available. We therefore used numbers from the closest analogue to this region, the Pine Bluff Arsenal in Arkansas, as a proxy for more complete information describing the incineration option at Pueblo.

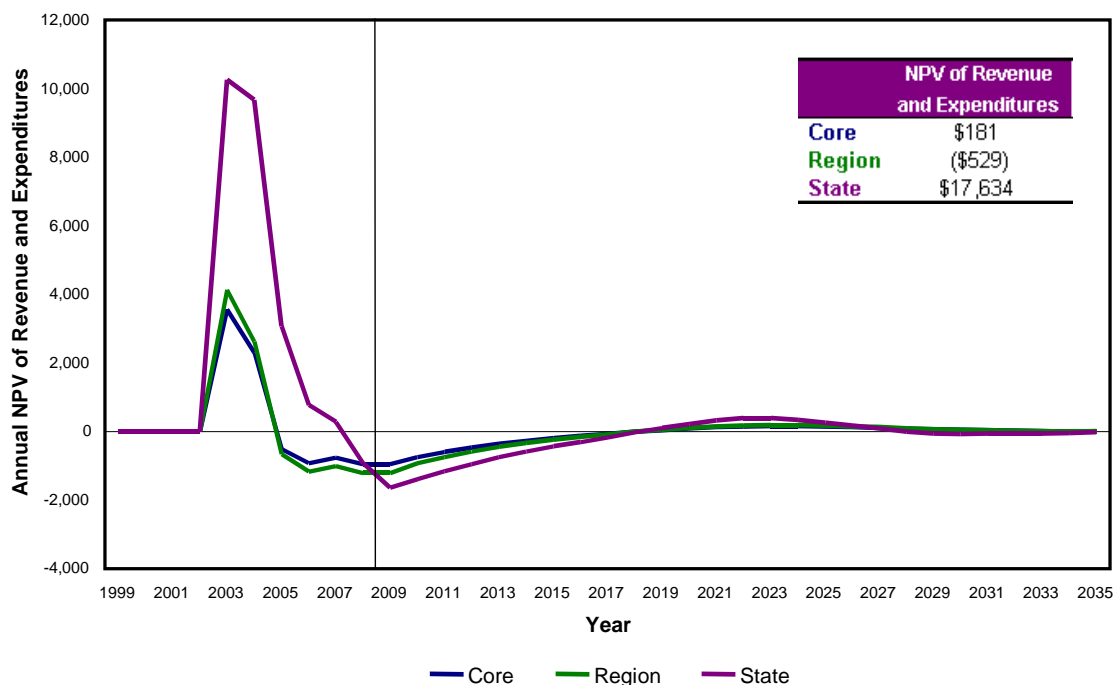
Construction began at Pine Bluff in 1999 and operations there are to be completed by the end of 2006. We reduced the Pine Bluff expenditures and employment slightly to

approximate the cost of the Pueblo facility more closely. Also, we assumed that construction would start in 2003 and operations would end in 2007. We picked the end date of 2007 to be consistent with DoD's stated goals and not as a result of an independent schedule estimate on our part.

We also ran a simulation using the ACWA cost, manpower, and schedule figures for the hydrolysis and biodegradation option at Pueblo. These results are discussed separately, below.

### 3. Simulated Effect

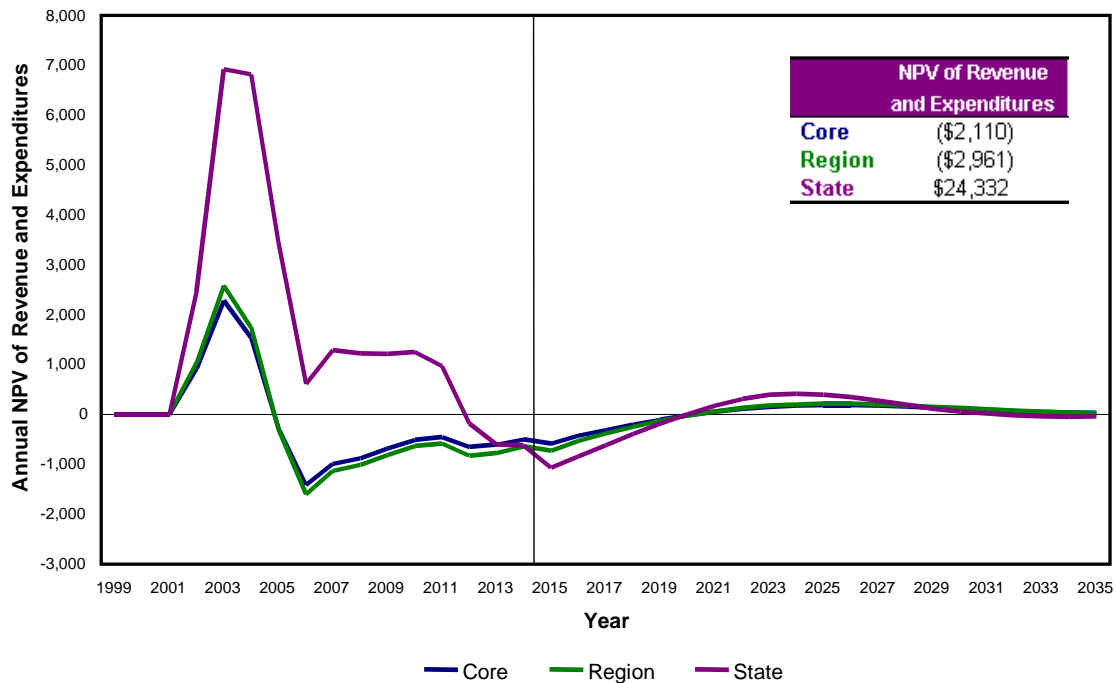
Figure 19 indicates that the fiscal effect at the state level for the incineration option is substantially positive (\$18 million in discounted dollars). At the core of the region, Pueblo County, the simulation shows the change in expenditures nearly equaling the change in revenue, producing only a small net effect over the period. For the core and surrounding counties combined, the negative effect is about \$0.5 million.



**Figure 19. Pueblo Region's Annual Net Revenues: DoD Schedule**

Figure 20 shows the effect on the various economies of the ACWA cost and schedule estimates for the hydrolysis and biodegradation option. Under this scenario, the small losses in the region increase to more substantial losses. The core county stands to lose \$2 million and the total region is estimated to lose \$3 million under the ACWA

simulation. Under the more expensive ACWA approach, however, the state will enjoy a higher net revenue, estimated at \$24 million.



**Figure 20. Pueblo Region’s Annual Net Revenues: ACWA Schedule**

Adding 3 years to each of these scenarios improves the results for the regional economies by adding from \$2 or \$3 million in net revenues. It also improves the state results for incineration by \$10 million and for ACWA technology by \$6 million. Since longer schedules did not result in greater negative effects, we did not consider these results in our conclusions.

#### 4. Other Considerations

The following issues were not factored into the preceding quantitative results.

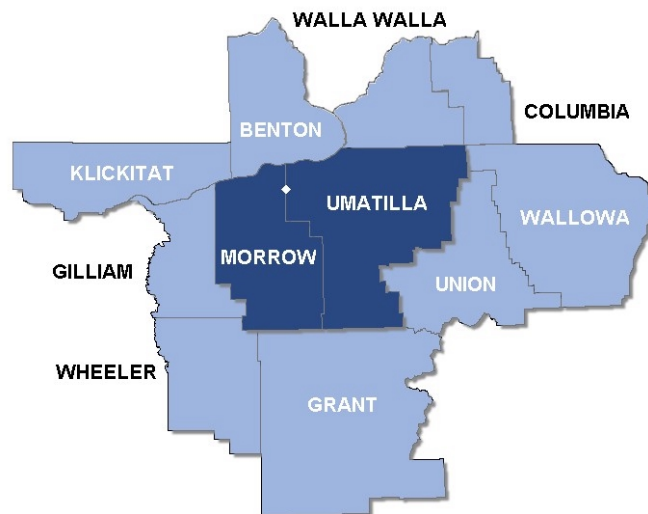
- The Route 50 Interchange at the depot needs to be upgraded, an additional evacuation road is needed to the north of the depot, and a new road should be built from the depot directly to I-25 so that DoD trucks can avoid rather than add to traffic congestion. (This came up during Meeting 2 of our visit to Pueblo—see Appendix A for a list of participants at each meeting.)
- The wastewater treatment facility that the county is building should be shared with the depot. (This also came up during Meeting 2.)

- Training funds should be made available to better qualify the local labor force for the higher paying chemical demilitarization jobs (Meeting 2).
- Although PL-874 provides funding to local schools because of reduced property taxes for federal employees and military personnel who reside on military installations (federal property), recent funding for that purpose has been only about 25% of requirements and has been delayed in payment (Meeting 9).

## **I. UMATILLA CHEMICAL DEPOT (OREGON)**

### **1. Composition of the Region**

Figure 21 shows the area surrounding Umatilla Chemical Depot. The core of the region consists of Morrow and Umatilla Counties, where the depot is located. The surrounding region is made up of Wallowa, Union, Grant, Wheeler, and Gilliam counties in Oregon and Klickitat, Benton, Walla Walla, and Columbia counties in Washington. Results of Census 2000 show the populations of the core and surrounding region to be 81,543 and 264,033, respectively.



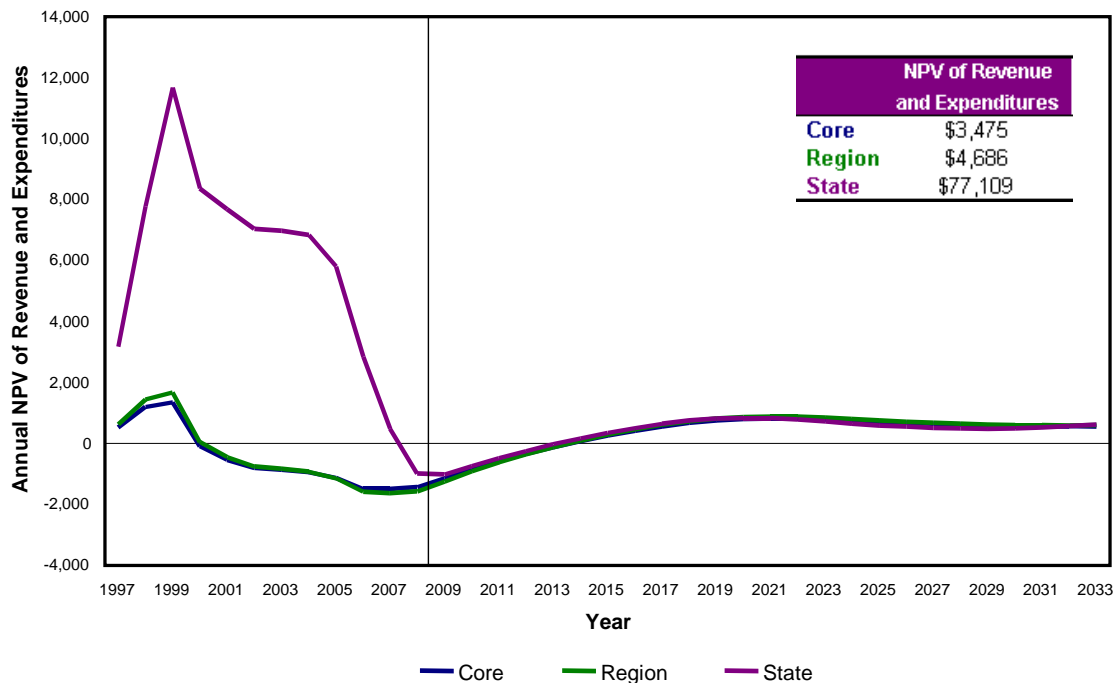
**Figure 21. Region Surrounding Umatilla Chemical Depot**

### **2. Period of the Analysis**

Construction began at Umatilla in 1997. The current schedule calls for operations to be completed by the end of 2006.

### 3. Simulated Effect

This region exhibits the greatest (most positive) effects of any of the facilities for all of the studied economies. Effects to the core and to the entire region are in the range of \$3 million and \$5 million, respectively, while the net state effect is \$77 million. Figure 22 illustrates the effect to each of the economies over the 35-year simulation interval. Notice that this is the only region where the net effect rises quickly out of the slump associated with closure, and remains solidly in the positive region of the graph throughout the remainder of the simulation.



**Figure 22. Umatilla Region's Annual Net Revenues: DoD Schedule**

The effect of adding 3 years to the schedule does little to the local and regional results, however the positive effect at the state level increases to \$97 million.

### 3. Other Considerations

The following issues that came up during our visit to the site were not factored into the preceding quantitative results.

- Additional infrastructure is needed in the local area to support chemical demilitarization activities. Many road problems cited are primarily FEMA issues, however, and are only secondarily related to chemical demilitarization. For example, the interstate overpass is congested and poorly designed. (This

came up during Meetings 2 and 3 of our visit to Umatilla—see Appendix A for a list of participants at each meeting.)

- A bridge across Umatilla River is needed to evacuate local people from Hermiston. (This also came up during Meetings 2 and 3.)





## IV. CONCLUSION

Table 4 summarizes the results of the net economic effects on local and state governments of chemical demilitarization for the eight sites we studied. Results for each site are given for the core, region, and state for both the current DoD schedule (using a 35-year simulation) and for the extended schedule (using a 38-year simulation). Dual results are given for Pueblo, although we consider only the more negative estimates for the ACWA method of destruction in the summary table (Table S-1).

**Table 4. Net Present Value of the Economic Effect**

Facility	Net Effect (Discounted 2001 \$K)					
	Current DoD Schedule			DoD Schedule + 3 years		
	Core	Region	State	Core	Region	State
Anniston	(1,800)	(1,900)	26,400	(1,500)	(1,600)	35,900
Blue Grass	(3,600)	(2,700)	36,300	(3,400)	(2,300)	38,900
Deseret	(24,200)	(21,400)	38,900	(26,200)	(22,600)	45,100
Edgewood	(500)	(600)	8,500	1,900	1,800	14,200
Newport	(4,000)	(2,500)	9,600	(4,800)	(2,800)	13,900
Pine Bluff	3,800	5,300	37,100	5,700	7,600	46,200
Pueblo						
Incineration	200	(500)	17,600	3,400	2,400	28,200
ACWA	(2,100)	(3,000)	24,300	(100)	(1,000)	29,600
Umatilla	3,500	4,700	77,100	3,000	4,500	97,300

Note: Parentheses denote net negative effects.

The table shows the wide variance among the net economic effects to the core and contiguous counties. It also shows that the extended schedule usually improves the overall effect, whether it is negative or positive under the DoD schedule. At Deseret and Newport, however, the effect is exacerbated by the extended schedule due to the longer negative economic reverberations that occur at these locations. Since we knew of no reason to suspect that the schedule will slip at these sites, we show the figures for only the DoD schedule in Table S-1. The effects improved under the extended scenarios at the two sites where we imposed short schedules to be consistent with DoD goals, Blue Grass and Pueblo. Therefore, we felt we did not have to estimate a different (longer) schedule for

these sites on the assumption that compensation for the compressed schedule would be sufficient to cover any requirements under a protracted schedule.

If, based on these results or other input, the Secretary determines that economic assistance to any or all of the communities is needed and appropriate, he should base the amount of assistance on the following criteria:

- The definition of *community*.
- The delta between net benefits (revenue) and net costs (expenses).
- The effect from chemical demilitarization related to specific needs, such as roads, bridges, shelters, or facility modifications.

We limited the definition of community to counties and states and show economic effects at the core, region, and states affected. Under the definitions in this study, the affected communities could be the core counties, the eight regions consisting of the core counties and their contiguous counties, or any state containing a core or contiguous county.

We computed deltas for the affected counties and states using strict economic definitions for cost and benefit with a 35-year modeling interval and the real rate for the federal government as defined by OMB Circular A-94, adjusted to an equivalent tax-free rate to represent the cost of money to a community.

Although we noted concerns about specific needs of the communities we visited, we did not attempt to verify or quantify them. Quantification of such needs would require additional effort.



## **APPENDIX A**



## PEOPLE WHO MET WITH THE STUDY TEAM

As noted in the body of this paper, the study team met with over 250 local elected officials, economic development officials, business leaders, and concerned citizens. Between five and nine separate meetings were held during visits to each facility. This appendix lists the names and affiliations of local participants at those meetings. The names are arranged alphabetically by meeting within each section. The section headings note the dates the study team visited the facilities.

### ANNISTON CHEMICAL ACTIVITY, 24–26 APRIL 2001

#### Meeting 1

Name	Affiliation
Coleman, Cathy	Public Affairs Officer, Anniston Chemical Activity (ANCA)
Gill, Lisa	Demilitarization Officer, ANCA
Phelps, Jack	Civilian Executive Assistant, ANCA
Poor, Jesse	Civilian Executive Assistant, Anniston Army Depot (ANAD)
Williams, Bruce, Lt. Col.	Commander, ANCA

#### Meeting 2

Name	Affiliation
Garrett, Tim	Site Project Manager, Program Manager for Chemical Demilitarization

#### Meeting 3

Name	Affiliation
Curtis, James W. (Bill)	Executive Director, East Alabama Regional Planning Commission

#### Meeting 4

Name	Affiliation
Wilkins, Erma	Chairperson, Citizens' Advisory Commission

#### Meeting 5

Name	Affiliation
Coker, Lonnie	Member, Annistonians for a Clean Environment (ACE)
Coker, Tommi	Member, ACE

*(Continued on the next page.)*

Crosby, Jeffery	Member, ACE
Crosby, Marie	Member, ACE
Howland, Keith	Chairperson, ACE
Lazenboy, Brian	Reporter, Anniston Star
Thornton, Bob	CSEPP Coordinator, Innovative Emergency Management

### Meeting 6

Name	Affiliation
Bluemink, Elizabeth	Reporter, Anniston Star
Fagan, Charlie	Mayor, Piedmont
Howell, Chip	Mayor, Anniston
Kimbrough, Ed	Mayor, Weaver
Pyles, Robert	Mayor, Hobson City
Roberson, Joseph	Mayor, Ohatchee
Smith, Jerry	Mayor, Jacksonville
Smith, Leon	Mayor, Oxford
Solheim, Nathan	Reporter, Anniston Star

### Meeting 7

Name	Affiliation
Colvert, Angela	Field Representative for Senator Jeff Sessions
Sutton, H. Goodloe, Jr.	State Director for Senator Richard Shelby
Whaley, Leland	Field Representative for Congressman Riley

### Meeting 8

Name	Affiliation
Acker, Aaron	Acker Electric Company
Anderson, Dick	Hudson Valley Steel Corporation
Brown, Greg	B. R. Williams Trucking, Inc.
Colvert, Angela	Field Representative for Senator Jeff Sessions
Deal, Ken	Alabama Power Company
Higgins, Duane	President, Calhoun County Chamber of Commerce
Phillips, Walton	Calhoun County Chamber of Commerce
Sylvester, Larry	Calhoun County Chamber of Commerce
Whaley, Leland	Field Representative for Congressman Riley

### Meeting 9

Name	Affiliation
Burney, Michael	Calhoun County Emergency Management Agency (EMA)
Champ, Delois	Calhoun County EMA
Downing, Robert	Calhoun County Commissioner
Dunn, James	Calhoun County Commissioner

(Continued on the next page.)

Fite, Lea	Calhoun County Commissioner
Henderson, Eli	Calhoun County Commissioner
Livingston, Rose	Reporter, Birmingham News
Markert, Charles	Calhoun County Engineer
Lazenboy, Brian	Reporter, Anniston Star
Springer, Dave	Attorney representing Calhoun County
Wood, Randy	Chairman, Calhoun County Commission

## **BLUE GRASS CHEMICAL ACTIVITY, 21–22 MARCH 2001**

### **Meeting 1**

<b>Name</b>	<b>Affiliation</b>
Fannin, R. Wayne	Civilian Executive Assistant, Blue Grass Army Depot
Riley, John, Maj.	Commander, Blue Grass Chemical Activity

### **Meeting 2**

<b>Name</b>	<b>Affiliation</b>
Cain, Jesse	Madison County Staff
Clark, Kent	Madison County Judge
Cross, Shirl	Madison County Staff
Rasmusson, Bob	Madison County Staff

### **Meeting 3**

<b>Name</b>	<b>Affiliation</b>
Hindman, Doug, Dr.	Co-chair, Citizens' Advisory Commission (CAC)

### **Meeting 4**

<b>Name</b>	<b>Affiliation</b>
Brandenburg, Fred	Richmond Fire Chief
DeBond, Charles	Richmond Police Chief
Durham, Anne	Mayor, Richmond
Evans, David	Richmond City Manager
Strong, William	Richmond City Commission

### **Meeting 5**

<b>Name</b>	<b>Affiliation</b>
Kerby, Clifford, Dr.	Mayor, Berea
Stone, Randy	Berea City Administrator



## DESERET CHEMICAL DEPOT, 27 FEB–1 MAR 01

### Meeting 1

Name	Affiliation
Aldrich, Wayne	Manpower at Deseret Chemical Depot
Huff, Rodney	Ammunition Operations, history from 1994
Huff, Susan	Chemical Stockpile Emergency Preparedness Public Affairs Office
Martinez, Theresa	Manpower at Tooele Army Depot
Pate, Ed, Col.	Deseret Chemical Depot Commander
Pettebone, John	Demilitarization Public Affairs Office

### Meeting 2

Name	Affiliation
Hunsaker, Teryl	Tooele County Commissioner
Perry, Ron	Appraiser, Supervisor, Treasurer's Office
Sagers, Keri	Director, Emergency Management, Tooele County
White, Gene	Tooele County Commissioner

### Meeting 3

Name	Affiliation
Roberts, Charlie	Mayor, Tooele

### Meeting 4

Name	Affiliation
Caldwell, Monte	Deputy Program Manager, PM/CSD
Colburn, James	General Manager EG&G
Werby, Clint	BAH Outreach Office, Tooele, Vermont

### Meeting 5

Name	Affiliation
Danner, Peter	Director of Economic Research, The Governor's Office of Planning and Budget
Downs, Dennis	Director, Department of Environmental Quality (DEQ), Division of Solid and Hazardous Waste
Jex, Douglas	Research Director, UDBED
Winters, Suzanne, Dr.	State Science Advisor

## EDGEWOOD CHEMICAL ACTIVITY, 6 MARCH 2001

### Meeting 1

Name	Affiliation
Flamm, Kevin	Program Manager, Alternative Techniques and Approaches
Mahall, Greg	Program Manager, Chemical Demilitarization, Public Affairs Office
Whyne, Conrad	Deputy Project Manager for Chemical Stockpile Disposal, Program Manager for Chemical Demilitarization

### Meeting 2

Name	Affiliation
Deweese, Katherine	ECA, Public Affairs Officer
Haga, Carolyn	SAIC
Lovrich, Joe	Program Manager, Aberdeen Chemical Agent Disposal Facility (ABCDF)
Monteverde, Miguel	Bechtel Aberdeen Public Outreach Manager
Murphy, Francis	ECA, Civilian Executive Assistant
Rutten, Donna, Maj.	Commander, Edgewood Chemical Activity (ECA)
Willman, Jim	Bechtel-Procurement

### Meeting 3

Name	Affiliation
Engleson, George	Co-chair, Citizens Advisory Commission (CAC), former Mayor, Aberdeen

### Meeting 4

Name	Affiliation
Christ, Eric	Emergency Services Manager
Richmond, Doug	Harford County Emergency Planner

### Meeting 5

Name	Affiliation
Wilson, Douglas	Mayor, Aberdeen

## NEWPORT CHEMICAL DEPOT, 10–11 APRIL 2001

### Meeting 1

Name	Affiliation
Arthur, Terry	Newport Chemical Depot Public Affairs Officer
Catney, Chastity	Stone and Webster Corporation—Program and Integration Support Contractor

(Continued on the next page.)

Corado, Ginger	Parsons Infrastructure and Technology Group
Haas, Patrick	Resident Engineer and Deputy Site Manager, Army Corps of Engineer
Isaacson, Chris, Maj.	Commander, Newport Chemical Depot (NECD)
Lichtenberger, Dean	Mason-Hanger—Newport Chemical Depot Support Contractor
Swenson, Clark	Newport Chemical Disposal Facility Project/Site Manager— Parsons Infrastructure and Technology Group

## Meeting 2

Name	Affiliation
Crossley, Harry	Vermillion County Commissioner, District #1
Cutrell, Clyde	Interested citizen
Feroglio, Jack	Vermillion County Economic Development Center
Julian, Don	Vermillion County Local Reuse Authority
Marietta, Dennis	Vermillion County Commissioner, District #2
Mayes, Arlene	Vermillion County Deputy Auditor
Smith, Loretta	Vermillion County Economic Development Center
Swinford, Leland	Interested citizen
Swinford, Ruth Ann	Vermillion County Auditor
Treaster, Sandi	Vermillion County Economic Development Center
Wilson, Tim	Vermillion County Commissioner, District #3 and Commission President

## Meeting 3

Name	Affiliation
Silotto, Jack	President, Vermillion County Council

## Meeting 4

Name	Affiliation
Nicholas, George	President, Parke County Commission

## Meeting 5

Name	Affiliation
Sheppard, Ron	Mayor, Clinton

## Meeting 6

Name	Affiliation
Beardsley, Joe	Vermillion County Economic Development Center
Feroglio, Jack	Vermillion County Economic Development Center
Julian, Don	Vermillion County Local Reuse Authority
Rendaci, Bob	Vermillion County Economic Development Center
Smith, Loretta	Vermillion County Economic Development Center
Treaster, Sandi	Vermillion County Economic Development Center

### Meeting 7

Name	Affiliation
Card, Richard	Field Operations Coordinator, Chemical Stockpile Emergency Preparedness Program, State of Indiana Emergency Management Agency
Ralston, Patrick	Executive Director, State of Indiana Emergency Management Agency

## PINE BLUFF CHEMICAL ACTIVITY, 19-20 MARCH 2001

### Meeting 1

Name	Affiliation
Lightfoot, Frank	local newspaper publisher
Morgan, "Jitters"	Mayor, White Hall

### Meeting 2

Name	Affiliation
Chapman, Steve, Col.	Commander, Pine Bluff Arsenal (PBA)
Hagar, Ben, LTC	Commander, Pine Bluff Chemical Activity (PBCA)
Magnini, Marquitta	Manager, Arsenal Support Agreements, PBA
McGehee, Ann	Strategic Planner, PBA

### Meeting 3

Name	Affiliation
Bartley, Randy	WDC—Deputy PM
Brannock, Jeanne	WDC—Human Resources Manager
Burns, Al	Program Manager, Washington Demilitarization Company (WDC)
Long, Randy	SAIC PAIS Contractor
Ross, Boyce	Program Manager for Pine Bluff Chemical Demilitarization Facility (PBCDF)

### Meeting 4

Name	Affiliation
King, "Dutch"	Mayor, Pine Bluff

### Meeting 5

Name	Affiliation
Dial, Elizabeth	Deputy Coordinator, Jefferson County Office of Emergency Management
Featherston, Jim	Coordinator, Jefferson County Office of Emergency Management
Jones, Jack	Jefferson County Judge

**Meeting 6**

<b>Name</b>	<b>Affiliation</b>
Scallion, Jean	PBA Citizen's Advisory Commission

**Meeting 7**

<b>Name</b>	<b>Affiliation</b>
McNulty, Jack	Member, Alliance of Jefferson County, Arkansas
Norton, Judi	Member, Alliance of Jefferson County, Arkansas
Sanders, William	Member, Alliance of Jefferson County, Arkansas

**Meeting 8**

<b>Name</b>	<b>Affiliation</b>
Pierce, Derrill	Arkansas Department of Economic Development

**PUEBLO CHEMICAL DEPOT, 7-9 MAY 2001****Meeting 1**

<b>Name</b>	<b>Affiliation</b>
Coulson, Sue	Public Relations, Earth Tech, Inc
Kennemeyer, Bob	Booz-Allen Hamilton
Megnia, John, LTC	Commander, Pueblo Chemical Depot (PUCD),

**Meeting 2**

<b>Name</b>	<b>Affiliation</b>
Douglas, Steve	Emergency Manager, Pueblo County
Hart, Terry	Attorney, Pueblo County
Kennedy, Loretta	Commissioner, Pueblo County
Klomp, John	Commissioner, Pueblo County and Chairperson, Citizens' Advisory Commission (CAC)
Peulen, Matt	Chairperson, Pueblo County Commission

**Meeting 3**

<b>Name</b>	<b>Affiliation</b>
Ballinger, Carl	Pueblo County CSEPP Coordinator
Evelt, Lee	City Manager, Pueblo
Galli, Dave	Assistant City Manager, Pueblo

#### Meeting 4

Name	Affiliation
Ballinger, Carl	Pueblo County CSEPP Coordinator
Finley, Chuck	Executive Director, Pueblo Depot Activity Development Authority
Gutierrez, Sandy	President and CEO, Latino Chamber of Commerce
Slyhoff, Rod	Pueblo Chamber of Commerce
Spaccamonti, Jim	Pueblo Economic Development Corporation (PEDCO)

#### Meeting 5

Name	Affiliation
Billings, Jim	Police Chief, Pueblo County
Corsentino, Dan	Sheriff, Pueblo County
Denis, Ilene	Representing C.W. Smith (Administrator, Parkview Hospital)
Douglas, Steve	Emergency Manager, Pueblo County
Heine, Pat, Det.	representing Jim Billings (Police Chief, Pueblo)
Silva, Bob	Sheriff's Office, Pueblo County

#### Meeting 6

Name	Affiliation
Cvar, Tom	Director, Pueblo City Public Works
Douglas, Steve	Emergency Manager, Pueblo County
Downs, Laura	Pueblo County Public Works
Randall, Alf	Pueblo County Public Works
Severance, Greg	Director, Pueblo County Public Works

#### Meeting 7

Name	Affiliation
Sobolik, Frank	County Extension Director, Colorado State University Cooperative Extension

#### Meeting 8

Name	Affiliation
Berumen, Tony	Director, Pueblo City Housing and Community Development
Occhiato, Patsy	Director, Pueblo County Housing and Human Services

#### Meeting 9

Name	Affiliation
Douglas, Steve	Emergency Manager, Pueblo County
Musso, John	Representing Dr. Joyce Bales (Superintendent, School District 60)
Rose, Debbie	President, School District 70
Yager, Stuart, Dr.	Superintendent, School District 70

## UMATILLA CHEMICAL DEPOT, 2–5 APRIL 2001

### Meeting 1

Name	Affiliation
Ballew, Gary	Benton County Sustainable Development
Bowman, Leo	Commissioner, Benton County, Washington
Davis, Deanna	Benton County Emergency Management
Mizell, Lorlee	Benton County Emergency Services

### Meeting 2

Name	Affiliation
Brown, Beverly	State Police Commander on temporary assignment as State Director of Chemical Stockpile Emergency Preparedness Program (CSEPP)
Brown, Chris	Oregon State CSEPP
Thomas, Wayne	Administrator, Chemical Demilitarization Program, Oregon DEQ

### Meeting 3

Name	Affiliation
Bell, Jeannette	Mayor, Echo
Berry, Diane	City Administrator, Echo
Bonnett, Shelley	City Manager, Stanfield
Clucas, Larry	Umatilla City Staff
Fox, Linda	Mayor, Irrigon
Hash, George	Mayor, Umatilla
McCann, Tom	Mayor, Stanfield
Mather, Rex	Boardman City Staff
Reay, Patrick	City Administrator, Irrigon
Sevelson, Bob	Mayor, Hermiston
Whitehead, Val	Stanfield County

### Meeting 4

Name	Affiliation
Anderson, Gary	Interim Site Project Manager, Umatilla Chemical Agent Disposal Facility
Benham, Royce	SAIC staff—support contractor to Program Manager for Chemical Demilitarization (PMCD)
Binder, Mary Alice	UMCD Public Affairs Office
Jennings, Tom	Washington Demilitarization Group
Nelson, Robert	UMCD staff
Woloszyn, Tom, LTC	Commander, Umatilla Chemical Depot (UMCD)
Yakawich, Martin	UMCD staff

**Meeting 5**

<b>Name</b>	<b>Affiliation</b>
Flournoy, Robert	Chairman, Oregon Chemical Demilitarization Citizens Advisory Commission
Meyers, Thomas	Member, Oregon Chemical Demilitarization Citizens Advisory Commission
Munn, Wanda	Member, Oregon Chemical Demilitarization Citizens Advisory Commission

**Meeting 6**

<b>Name</b>	<b>Affiliation</b>
Beard, Casey	Morrow County Emergency Management staff
Brosnan, Dan	Morrow County Commissioner
Mabbott, Tamra	Morrow County Planner
Tallman, Terry	Judge, Morrow County
Wenholz, John	Morrow County Commissioner

**Meeting 7**

<b>Name</b>	<b>Affiliation</b>
Breckenridge, Lisa	Economic Development staff, Confederated Tribes of the Umatilla Indian Reservation
Gray, Ken	Fire Chief, Confederated Tribes of the Umatilla Indian Reservation
Tovey, Bill	Director of Economic Development, Confederated Tribes of the Umatilla Indian Reservation

**Meeting 8**

<b>Name</b>	<b>Affiliation</b>
Benkendorf, Al	The Benkendorf Associates Corporation
Doherty, Dennis	Chairman, Umatilla County Commission
Holeman, Emile	Umatilla County Commissioner
Olsen, Douglas	Umatilla County Counsel
Peet, Bruce	Budget Officer and Economic Development Director, Umatilla County

**Meeting 9**

<b>Name</b>	<b>Affiliation</b>
Kinney, Wayne	Field Representative, U.S. Senator Ron Wyden
Krikava, Richard	Field Representative, U.S. Senator Gordon Smith
Snider, John	Field Representative, Congressman Walden





## **APPENDIX B**



## REMI LINKAGES

Although REMI contains numerous equations, the five shaded blocks in Figure B-1 illustrate the model's underlying structure. Each block contains several components (shown in rectangular boxes), and the lines and arrows represent interactions of key components both within and between blocks. Most interactions flow both ways, indicating a highly simultaneous structure. Block 1, output linkages, forms the core of the model. An input-output structure represents the inter-industry linkages and final-demand linkages by industry. Interaction between Block 1 and the rest of the model is extensive. Predicted outputs from Block 1 drive labor demand in Block 2. Labor demand interacts with labor supply from Block 3 to determine wages. Combined with other factor costs, wages determine relative production costs and relative profitability in Block 4, which affects the market shares in Block 5. The market shares are influenced by the local demand in the region in Block 1 and exogenous export demand that local production fulfills.

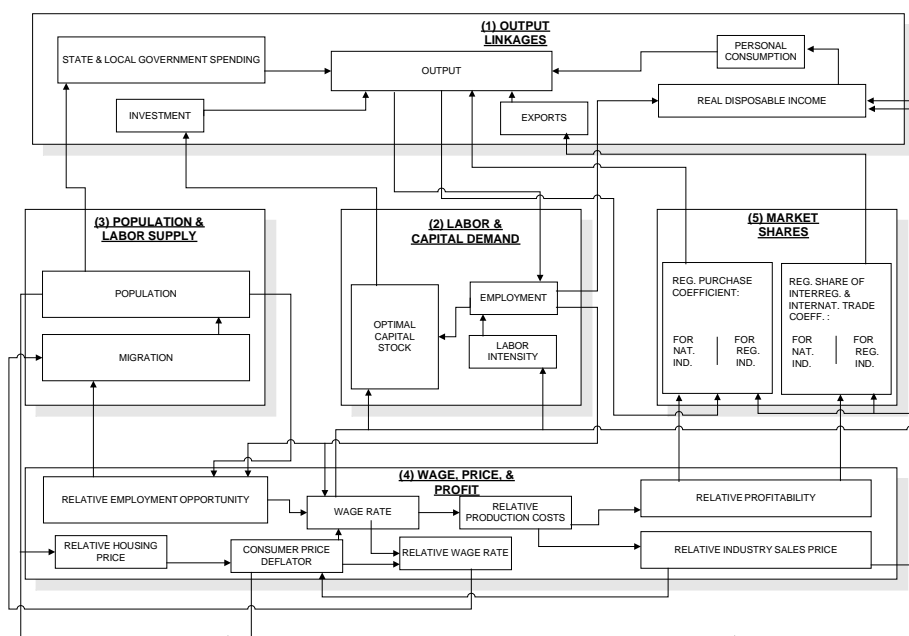


Figure B-1. Underlying Structure of REMI

The endogenous final demands include consumption, investment, and state and local government demand. Real disposable income drives consumption demands and is calculated by using the regional consumer price deflator from Block 4 to deflate nominal disposable income. An accounting identity defines nominal disposable income as wage income from Blocks 2 and 4, plus property income related to population and the cohort distribution of population calculated in Block 3, plus transfer income related to population less employment and retirement population, minus taxes. Optimal capital stock calculated in Block 2 drives investment, and population in Block 3 drives state and local government final demand. The endogenous final demands combined with exports drive the output block.

## **APPENDIX C**



## **TECHNICAL ADJUSTMENTS TO REMI**

### **TREATMENT OF CONTRACTOR EMPLOYMENT**

We entered contractor employment during the operations phase in the simulations as new employment in the chemical industry. REMI would normally impute new investment, plus new spending on intermediate goods and services, to support this incremental employment. However, because military spending on facilities and equipment is also input into the simulations, and in order to avoid double counting, we exercised the user option of nullifying the model's imputed values of investment and intermediate spending for this new employment.

### **FISCAL YEAR TO CALENDAR YEAR**

REMI is structured around calendar year (CY) data. Expenditure and employment data reported by the chemical processing activities pertain to U.S. government fiscal years (FYs). It was therefore necessary to put those data on a common footing with the model. To do that, we employed the following general relationship:

$$CY(t) = 0.75 \times FY(t) + 0.25 \times FY(t + 1).$$

For example, three-fourths of construction spending in fiscal year 2000 and one-fourth of the construction spending in fiscal year 2001 were used to represent calendar year 2000 construction spending. This procedure recognizes that the final 9 months of a fiscal year belong to the same calendar year, while the first 3 months of the next fiscal year complete the original calendar year.

### **POPULATION ADJUSTMENTS**

For 1991 through 2000, REMI contains population estimates developed by the U.S. Census Bureau prior to the completion of Census 2000 counts. We obtained the actual Census 2000 counts from the Census Bureau and compared them with the model's estimates. In most cases, the two were quite close, differing by a few percentage points or less. However, in a few cases, the differences were a good deal larger. We therefore decided to "force" the model to generate population data that were consistent with



Census 2000 counts by adjusting one of its population-driving variables. For 1990 through 2000, we used the annual growth rates implied by the actual 1990 and 2000 counts. For the years after 2000, we applied the control forecast's year-by-year population growth rates to Census 2000 counts. These changes constituted the adjusted control.

Table C-1 presents the price index used to convert prices denominated in nominal dollars to constant 2001 year dollar.

**Table C-1. Price Index**

Calendar Year	Factor
1988	74.088
1989	76.967
1990	79.846
1991	82.534
1992	84.453
1993	86.564
1994	88.484
1995	90.307
1996	92.035
1997	93.474
1998	94.722
1999	95.969
2000	97.985
2001	100.000
2002	102.111
2003	104.223
2004	106.430
2005	108.733
2006	110.940
2007	113.244
2008	115.643
2009	118.042
2010	120.633
2011	123.033
2012	125.624
2013	128.311
2014	130.998
2015	133.781
2016	136.564
2017	139.443

## CONVERSION OF FISCAL IMPACT TO THE YEAR 2001 PRICES

The model's estimates of fiscal impacts (changes in government revenue and expenditures) are computed in constant 1999 prices to permit an impact to be assessed in so-called *real* terms. This is useful analytically, but if any compensation were to be paid to a locality, that sum would almost certainly be determined in nominal (also called *then-year*) prices. We therefore constructed a set of price escalation factors to convert the output from constant to nominal prices. The factors are based on the implicit Gross Domestic Product (GDP) deflator, which is widely regarded as the best single measure of broad price movements across the economy.

For the historical price changes from 1988 through 1999, we referred to *National Defense Budget Estimates for FY 2001*, Office of the Under Secretary of Defense (Comptroller), March 2000, table 5-1. (The fiscal year values from this table were converted to a calendar-year basis as described above.) For 2000 through 2011, we drew from *Fiscal Year 2002 Budget of the United States Government: Analytical Perspectives*, Office of Management and Budget, table 1-1. Those factors were based on information available as of January 20, 2001. For the years after 2011, we assumed the same annual rate of price increase (2.1 percent) used in constructing the deflator values for 2000 through 2011.

The resulting factors are displayed in Table C-1.

## NET PRESENT VAULE ADJUSTMETNS

All of our results are displayed in discounted constant 2001 dollars in accordance with the Office of Management and Budget's Circular No. A-94, *Guidelines and Discount Rates for Benefit-Cost Analysis of Federal Programs*, October 1992. We selected the real (constant dollar) 30-year Treasury Note and Bond rate specified in Appendix C (as revised January 2001) of Circular A-94 as the basis for the discount rate used in our computations but converted it to a hypothetical local bond rate. The treasury rate, which reflects the federal government's borrow rate, does not compare directly with bond rates offered by the local communities. Local bonds have tax benefits (they are not subject to federal income taxes) that must be factored into their rates. We accounted for this favorable tax advantage by adjusting the federal discount rate of 5.3% to its equivalent tax-free rate for the top (31%) bracket. This results in an equivalent tax-free rate of 3.66%. We construe this as the most conservative (lowest) municipal bond rate possible since it is the tax-free equivalent to the federal government's 30-year bond rate.

This conforms to our general rule of erring on the side of community compensation so as to ensure that we have not underestimated any appropriate compensation amounts.

Since our model calculations were done in constant dollars, we actually used the real rate component of the federal rate, which is 3.2%, and reduced it by 31% to find the real component of the equivalent tax-free rate, which is 2.21%, and discounted the constant 2001 dollars in our impact streams accordingly.

We note that four of the eight communities in our study currently have bonds rated by Moody at the highest rating, Aaa, and that these rates are higher than 3.66%. One could argue that we should use these higher rates in compute the discounted compensations for each of these communities. We rejected this approach due to its complexity and the fact that there would be no precise way to determine a fair, locally adjusted discount rate.

## **APPENDIX D**



## **DATA TEMPLATES**

This appendix presents the data collected from each site and used as input to REMI. We consolidated the data from various sources (local government, contractors, Army, etc.) and displayed them using the data collection template shown in Chapter III. We adjusted fiscal year data to calendar years using the algorithm described in Appendix C.

Since we ran two simulations for each site, one according to the current DoD schedule and another that added 3 years to that schedule, we have two templates for each site for a total of sixteen templates. We always added 3 years to operations phase. The added years were averages of operation years.

The sixteen templates (two for each site) are presented on the pages that follow.

# ANNISTON

## Anniston Chemical Activity (Army Schedule)

Year 1 begins with the receipt of the Resource Conservation and Recovery Act permit. Please provide the data through official closure of the facility.

### Personnel Associated with the Chemical Weapons Demilitarization Program

PMCD	Systems Contractor	Chemical Activity (SBCCOM)	Depot	Other (Please specify):													
	FY 1	FY 2	FY 3	FY 4	FY 5	FY 6	FY 7	FY 8	FY 9	FY 10	FY 11	FY 12	FY 13	FY 14	FY 15		
<b>Construction Phase (Average Headcount)</b>																	
Military Personnel																	
Civilians																	
Federal Government	29,495	62,627	89,047	96.8	97,335												
State/Local Government																	
Contractors (Construction)																	
Contractors (Chemical)	13	48.25	123.5	206.75	372.75												
<b>Systemization Phase (Average Headcount)</b>																	
Military Personnel																	
Civilians																	
Federal Government						113,565	167.45										
State/Local Government						1	4										
Contractors (Chemical)						521.25	569.5										
<b>Operations Phase (Average Headcount)</b>																	
Military Personnel																	
Civilians																	
Federal Government								166.7	166.7	147,565							
State/Local Government								4	4	3							
Contractors (Chemical)								601.5	606	508.75							
<b>Closure/Shutdown Phase (Average Headcount)</b>																	
Military Personnel																	
Civilians																	
Federal Government											81.37	55	55	41.25			
State/Local Government																	
Contractors (Chemical)											162.75						
<b>Employee Demographics: Please estimate the percentage of workers that reside in the counties listed below:</b>																	
Calhoun County																	
All other contiguous Counties																	
<b>Estimated construction and material costs of the demilitarization facility (millions of 1999 dollars):</b>																	
Construction costs	7.09	35.675	70.165	107.1	87.0075	24.7725											
Estimated percentage of total construction costs that are materials																	
Total value of other recurring and nonrecurring material - costs not included in the above construction costs	1.0965	5.08375	6.50775	10.53	31.13	33.4375	17.81	17.5425	15.6475	11.592	4.5135						
Estimated percentage of all materials purchased in Calhoun County																	
Estimated percentage of all materials purchased in all other contiguous Counties																	

## Anniston Chemical Activity (Army Schedule +3)

Year 1 begins with the receipt of the Resource Conservation and Recovery Act permit. Please provide the data through official closure of the facility.

### Personnel Associated with the Chemical Weapons Demilitarization Program

PMCD	Systems Contractor	Chemical Activity (SBCCOM)	Depot	Other (Please specify):													
	FY 1	FY 2	FY 3	FY 4	FY 5	FY 6	FY 7	FY 8	FY 9	FY 10	FY 11	FY 12	FY 13	FY 14	FY 15	FY 16	FY 17
<b>Construction Phase (Average Headcount)</b>																	
Military Personnel																	
Civilians																	
Federal Government	29,495	62,627	89,047	96.8	97,335												
State/Local Government	0	0	0	0	0												
Contractors (Construction)																	
Contractors (Chemical)	13	48.25	123.5	206.75	372.75												
<b>Systemization Phase (Average Headcount)</b>																	
Military Personnel																	
Civilians																	
Federal Government						113,565											
State/Local Government						1											
Contractors (Chemical)						521.25											
<b>Operations Phase (Average Headcount)</b>																	
Military Personnel																	
Civilians																	
Federal Government						167.45	166.7	166.7	166.7	166.7	166.7	147,565					
State/Local Government						4	4	4	4	4	4	3					
Contractors (Chemical)						569.5	601.5	606	605.5	604.5	606	508.75					
<b>Closure/Shutdown Phase (Average Headcount)</b>																	
Military Personnel																	
Civilians																	
Federal Government														81.37	55	55	41.25
State/Local Government																	
Contractors (Chemical)														162.75			
<b>Employee Demographics: Please estimate the percentage of workers that reside in the counties listed below:</b>																	
Calhoun County																	
All other contiguous Counties																	
<b>Estimated construction and material costs of the demilitarization facility (millions of 1999 dollars):</b>																	
Construction costs	7.09	35.675	70.165	107.1	87.0075	24.7725											
Estimated percentage of total construction costs that are materials																	
Total value of other recurring and nonrecurring material - costs not included in the above construction costs	1.0965	5.08375	6.50775	10.53	31.13	33.4375	17.81	17.5425	15.6475	14.57	17.5425	16.38	13.7895	4.5135			
Estimated percentage of all materials purchased in Calhoun County																	
Estimated percentage of all materials purchased in all other contiguous Counties																	

# BLUE GRASS

Blue Grass Chemical Activity (Army Schedule)															
Year 1 begins with the receipt of the Resource Conservation and Recovery Act permit. Please provide the data through official closure of the facility.															
Personnel Associated with the Chemical Weapons Demilitarization Program															
PMCD	Systems Contractor	Chemical Activity (SBCCOM)	Depot	Other (Please specify):											
	FY 1	FY 2	FY 3	FY 4	FY 5	FY 6	FY 7	FY 8	FY 9	FY 10	FY 11	FY 12	FY 13	FY 14	FY 15
<b>Construction Phase (Average Headcount)</b>															
Military Personnel		1	1												
Civilians															
Federal Government		130	124.25												
State/Local Government		0	0												
Contractors (Construction)															
Contractors (Chemical)		0	285.25												
<b>Systemization Phase (Average Headcount)</b>															
Military Personnel				1											
Civilians															
Federal Government				153											
State/Local Government				4											
Contractors (Chemical)				1445.25											
<b>Operations Phase (Average Headcount)</b>															
Military Personnel				1											
Civilians															
Federal Government				176											
State/Local Government				12											
Contractors (Chemical)				1822.75											
<b>Closure/Shutdown Phase (Average Headcount)</b>															
Military Personnel					0.75										
Civilians															
Federal Government					55.5										
State/Local Government					0										
Contractors (Chemical)					162.75										
<b>Employee Demographics: Please estimate the percentage of workers that reside in the counties listed below:</b>															
Madison County															
All other contiguous Counties															
<b>Estimated construction and material costs of the demilitarization facility (millions of 1999 dollars):</b>															
Construction costs	179.55	105.3													
Estimated percentage of total construction costs that are materials															
Total value of other recurring and nonrecurring material - costs not included in the above construction costs	29.175	66.4	61.55	54.5	5.1										
Estimated percentage of all materials purchased in Madison County															
Estimated percentage of all materials purchased in all other contiguous Counties															

Blue Grass Chemical Activity (Army Schedule +3)															
Year 1 begins with the receipt of the Resource Conservation and Recovery Act permit. Please provide the data through official closure of the facility.															
Personnel Associated with the Chemical Weapons Demilitarization Program															
PMCD	Systems Contractor	Chemical Activity (SBCCOM)	Depot	Other (Please specify):											
	FY 1	FY 2	FY 3	FY 4	FY 5	FY 6	FY 7	FY 8	FY 9	FY 10	FY 11	FY 12	FY 13	FY 14	FY 15
<b>Construction Phase (Average Headcount)</b>															
Military Personnel		1	1												
Civilians															
Federal Government		130	124.25												
State/Local Government		0	0												
Contractors (Construction)															
Contractors (Chemical)		0	285.25												
<b>Systemization Phase (Average Headcount)</b>															
Military Personnel				0.75											
Civilians															
Federal Government				142.425											
State/Local Government				1											
Contractors (Chemical)				992.25											
<b>Operations Phase (Average Headcount)</b>															
Military Personnel															
Civilians															
Federal Government				167.45	166.7	166.7	147.565								
State/Local Government				4	4	4	3								
Contractors (Chemical)				559.5	601.5	606	508.75								
<b>Closure/Shutdown Phase (Average Headcount)</b>															
Military Personnel															
Civilians															
Federal Government								67.62							
State/Local Government															
Contractors (Chemical)								162.75							
<b>Employee Demographics: Please estimate the percentage of workers that reside in the counties listed below:</b>															
Madison County															
All other contiguous Counties															
<b>Estimated construction and material costs of the demilitarization facility (millions of 1999 dollars):</b>															
Construction costs	179.55	105.3													
Estimated percentage of total construction costs that are materials															
Total value of other recurring and nonrecurring material - costs not included in the above construction costs	29.175	66.4	48.3925	17.81	17.5425	15.6475	11.592	4.5135							
Estimated percentage of all materials purchased in Madison County															
Estimated percentage of all materials purchased in all other contiguous Counties															



# DESERET

**Deseret Chemical Depot (Army Schedule)**  
 Year 1 begins with the receipt of the Resource Conservation and Recovery Act permit. Please provide the data through official closure of the facility.

**Personnel Associated with the Chemical Weapons Demilitarization Program**

PMCD	Systems Contractor	Chemical Activity (SBCCOM)	Depot	Other (Please specify):																
	FY 1	FY 2	FY 3	FY 4	FY 5	FY 6	FY 7	FY 8	FY 9	FY 10	FY 11	FY 12	FY 13	FY 14	FY 15	FY 16	FY 17	FY 18	FY 19	
<b>Construction Phase (Average Headcount)</b>																				
Military Personnel		2	2	2	2	2														
Civilians																				
Federal Government		375	375	375	375	375														
State/Local Government																				
Contractors (Construction)																				
Contractors (Chemical)					18	210														
<b>Systemization Phase (Average Headcount)</b>																				
Military Personnel						2														
Civilians																				
Federal Government						375														
State/Local Government																				
Contractors (Chemical)						646														
<b>Operations Phase (Average Headcount)</b>																				
Military Personnel							2	2	1.75	1	1	1	1	1	1	1				
Civilians																				
Federal Government							375	414.25	532	532	528.5	515.5	501.25	477	373.25					
State/Local Government																				
Contractors (Chemical)							718.75	735.75	733.25	742.5	700.5	687	687	687	687	601.125				
<b>Closure/Shutdown Phase (Average Headcount)</b>																				
Military Personnel																1	1	1	0.75	
Civilians																				
Federal Government																68.75	61	61	45.75	
State/Local Government																				
Contractors (Chemical)																	343.5	343.5	343.5	
<b>Employee Demographics: Please estimate the percentage of workers that reside in the counties listed below:</b>																				
Tooele County																				
All other contiguous Counties																				
<b>Estimated construction and material costs of the demilitarization facility (millions of 1999 dollars):</b>																				
Construction costs	9.711611	46.07454	74.5885	92.00565	62.09265															
Estimated percentage of total construction costs that are materials																				
Total value of other recurring and nonrecurring material - costs not included in the above construction costs				0.236515	1.432803	2.995233	3.555021	4.163103	4.170289	5.637025	6.09728	6.737121	6.737121	6.737121	5.894981	3.36856	3.36856	3.36856	2.52642	
Estimated percentage of all materials purchased in Tooele County																				
Estimated percentage of all materials purchased in all other contiguous Counties																				

**Deseret Chemical Depot (Army Schedule +3)**  
 Year 1 begins with the receipt of the Resource Conservation and Recovery Act permit. Please provide the data through official closure of the facility.

**Personnel Associated with the Chemical Weapons Demilitarization Program**

PMCD	Systems Contractor	Chemical Activity (SBCCOM)	Depot	Other (Please specify):																
	FY 1	FY 2	FY 3	FY 4	FY 5	FY 6	FY 7	FY 8	FY 9	FY 10	FY 11	FY 12	FY 13	FY 14	FY 15	FY 16	FY 17	FY 18	FY 19	FY 20
<b>Construction Phase (Average Headcount)</b>																				
Military Personnel	2	2	2	2	2															
Civilians																				
Federal Government	375	375	375	375	375															
State/Local Government																				
Contractors (Construction)																				
Contractors (Chemical)	0	0	0	18	210															
<b>Systemization Phase (Average Headcount)</b>																				
Military Personnel						2														
Civilians																				
Federal Government						375														
State/Local Government																				
Contractors (Chemical)						646														
<b>Operations Phase (Average Headcount)</b>																				
Military Personnel						2	2	1.75	1	1	1	1	1	1	1	1	1	1	1	1
Civilians																				
Federal Government						375	414.25	532	532	528.5	515.5	501.25	477	475.75	508	508	405.5			
State/Local Government																				
Contractors (Chemical)						718.75	735.75	733.25	742.5	700.5	687	687	687	687	687	687	687	601.125		
<b>Closure/Shutdown Phase (Average Headcount)</b>																				
Military Personnel																		1	1	1
Civilians																				
Federal Government																		68.75	61	61
State/Local Government																				
Contractors (Chemical)																		343.5	343.5	343.5
<b>Employee Demographics: Please estimate the percentage of workers that reside in the counties listed below:</b>																				
Tooele County																				
All other contiguous Counties																				
<b>Estimated construction and material costs of the demilitarization facility (millions of 1999 dollars):</b>																				
Construction costs	9.711611	46.07454	74.5885	92.00565	62.09265															
Estimated percentage of total construction costs that are materials																				
Total value of other recurring and nonrecurring material - costs not included in the above construction costs				0.236515	1.432803	2.995233	3.555021	4.163103	4.170289	5.637025	6.09728	6.737121	6.737121	6.737121	6.737121	5.894981	3.36856	3.36856	3.36856	2.52642
Estimated percentage of all materials purchased in Tooele County																				
Estimated percentage of all materials purchased in all other contiguous Counties																				

# EDGEWOOD

## Edgewood Chemical Activity (Army Schedule)

Year 1 begins with the receipt of the Resource Conservation and Recovery Act permit. Please provide the data through official closure of the facility.

### Personnel Associated with the Chemical Weapons Demilitarization Program

PMCD <input type="checkbox"/>	Systems Contractor <input type="checkbox"/>				Chemical Activity (SBCCOM) <input type="checkbox"/>				Depot <input type="checkbox"/>		Other (Please specify): <input type="checkbox"/>				
	FY 1	FY 2	FY 3	FY 4	FY 5	FY 6	FY 7	FY 8	FY 9	FY 10	FY 11	FY 12	FY 13	FY 14	FY 15
<b>Construction Phase (Average Headcount)</b>															
Military Personnel															
Civilians															
Federal Government		10	30.5	40.75	59.5	95.25	103.5								
State/Local Government															
Contractors (Construction)															
Contractors (Chemical)						94.5									
<b>Systemization Phase (Average Headcount)</b>															
Military Personnel															
Civilians															
Federal Government							87.75								
State/Local Government															
Contractors (Chemical)							372.5								
<b>Operations Phase (Average Headcount)</b>															
Military Personnel															
Civilians															
Federal Government								81							
State/Local Government															
Contractors (Chemical)								327.25							
<b>Closure/Shutdown Phase (Average Headcount)</b>															
Military Personnel															
Civilians															
Federal Government									60.75						
State/Local Government															
Contractors (Chemical)									180.75						
<b>Employee Demographics: Please estimate the percentage of workers that reside in the counties listed below:</b>															
Harford County															
All other contiguous Counties															
<b>Estimated construction and material costs of the demilitarization facility (millions of 1999 dollars):</b>															
Construction costs	0.25	2	9.25	22.75	22.25	10.5									
Estimated percentage of total construction costs that are materials															
Total value of other recurring and nonrecurring material - costs not included in the above construction costs	0.5	6.25	32.5	72	59.75	24									
Estimated percentage of all materials purchased in Harford County															
Estimated percentage of all materials purchased in all other contiguous Counties															

## Edgewood Chemical Activity (Army Schedule +3)

Year 1 begins with the receipt of the Resource Conservation and Recovery Act permit. Please provide the data through official closure of the facility.

### Personnel Associated with the Chemical Weapons Demilitarization Program

PMCD <input type="checkbox"/>	Systems Contractor <input type="checkbox"/>				Chemical Activity (SBCCOM) <input type="checkbox"/>				Depot <input type="checkbox"/>		Other (Please specify): <input type="checkbox"/>				
	FY 1	FY 2	FY 3	FY 4	FY 5	FY 6	FY 7	FY 8	FY 9	FY 10	FY 11	FY 12	FY 13	FY 14	FY 15
<b>Construction Phase (Average Headcount)</b>															
Military Personnel															
Civilians															
Federal Government		10	30.5	40.75	59.5	95.25	103.5								
State/Local Government															
Contractors (Construction)															
Contractors (Chemical)						94.5									
<b>Systemization Phase (Average Headcount)</b>															
Military Personnel															
Civilians															
Federal Government							87.75								
State/Local Government															
Contractors (Chemical)							372.5								
<b>Operations Phase (Average Headcount)</b>															
Military Personnel															
Civilians															
Federal Government								81	81	81	81				
State/Local Government															
Contractors (Chemical)								366	366	366	327.25				
<b>Closure/Shutdown Phase (Average Headcount)</b>															
Military Personnel															
Civilians															
Federal Government												60.75			
State/Local Government															
Contractors (Chemical)												180.75			
<b>Employee Demographics: Please estimate the percentage of workers that reside in the counties listed below:</b>															
Harford County															
All other contiguous Counties															
<b>Estimated construction and material costs of the demilitarization facility (millions of 1999 dollars):</b>															
Construction costs	0.25	2	9.25	22.75	22.25	10.5									
Estimated percentage of total construction costs that are materials															
Total value of other recurring and nonrecurring material - costs not included in the above construction costs	0.5	6.25	32.5	72	59.75	24									
Estimated percentage of all materials purchased in Harford County															
Estimated percentage of all materials purchased in all other contiguous Counties															

# NEWPORT

<b>Newport Chemical Depot (Army Schedule)</b>																
Year 1 begins with the receipt of the Resource Conservation and Recovery Act permit. Please provide the data through official closure of the facility.																
<b>Personnel Associated with the Chemical Weapons Demilitarization Program</b>																
PMCD	Systems Contractor				Chemical Activity (SBCCOM)				Depot	Other (Please specify):						
	FY 1	FY 2	FY 3	FY 4	FY 5	FY 6	FY 7	FY 8	FY 9	FY 10	FY 11	FY 12	FY 13	FY 14	FY 15	
<b>Construction Phase (Average Headcount)</b>																
Military Personnel																
Civilians																
Federal Government		22.75	39.25	45.75	38.5											
State/Local Government																
Contractors (Construction)																
Contractors (Chemical)		13.25	18.5	52	212.75											
<b>Systemization Phase (Average Headcount)</b>																
Military Personnel																
Civilians																
Federal Government					17											
State/Local Government																
Contractors (Chemical)					425.5											
<b>Operations Phase (Average Headcount)</b>																
Military Personnel																
Civilians																
Federal Government						14	18									
State/Local Government																
Contractors (Chemical)					381.75	255										
<b>Closure/Shutdown Phase (Average Headcount)</b>																
Military Personnel																
Civilians																
Federal Government								2.25								
State/Local Government																
Contractors (Chemical)								29.25								
<b>Employee Demographics: Please estimate the percentage of workers that reside in the counties listed below:</b>																
Vermillion County																
All other contiguous Counties																
<b>Estimated construction and material costs of the demilitarization facility (millions of 1999 dollars):</b>																
Construction costs	25.37653	52.88629	25.65399	2.745668	0.300058	0.061993	0.027024	0.020162								
Estimated percentage of total construction costs that are materials																
Total value of other recurring and nonrecurring material - costs not included in the above construction costs	4.713151	3.295848	2.5631	2.945589	2.816499											
Estimated percentage of all materials purchased in Vermillion County																
Estimated percentage of all materials purchased in all other contiguous Counties																

<b>Newport Chemical Depot (Army Schedule +3)</b>																
Year 1 begins with the receipt of the Resource Conservation and Recovery Act permit. Please provide the data through official closure of the facility.																
<b>Personnel Associated with the Chemical Weapons Demilitarization Program</b>																
PMCD	Systems Contractor				Chemical Activity (SBCCOM)				Depot	Other (Please specify):						
	FY 1	FY 2	FY 3	FY 4	FY 5	FY 6	FY 7	FY 8	FY 9	FY 10	FY 11	FY 12	FY 13	FY 14	FY 15	
<b>Construction Phase (Average Headcount)</b>																
Military Personnel																
Civilians																
Federal Government		22.75	39.25	45.75	38.5											
State/Local Government																
Contractors (Construction)																
Contractors (Chemical)		13.25	18.5	52	212.75											
<b>Systemization Phase (Average Headcount)</b>																
Military Personnel																
Civilians																
Federal Government					17											
State/Local Government																
Contractors (Chemical)					425.5											
<b>Operations Phase (Average Headcount)</b>																
Military Personnel																
Civilians																
Federal Government						14	21.5	17	17	13.5						
State/Local Government																
Contractors (Chemical)					381.75	336.125	363.5	363.5	282.375							
<b>Closure/Shutdown Phase (Average Headcount)</b>																
Military Personnel																
Civilians																
Federal Government											2.25					
State/Local Government																
Contractors (Chemical)											29.25					
<b>Employee Demographics: Please estimate the percentage of workers that reside in the counties listed below:</b>																
Vermillion County																
All other contiguous Counties																
<b>Estimated construction and material costs of the demilitarization facility (millions of 1999 dollars):</b>																
Construction costs	25.37653	52.88629	25.65399	2.745668	0.300058	0.061993	0.032892	0.050353	0.050353	0.044485	0.020162					
Estimated percentage of total construction costs that are materials																
Total value of other recurring and nonrecurring material - costs not included in the above construction costs	4.713151	3.295848	2.5631	2.945589	2.816499											
Estimated percentage of all materials purchased in Vermillion County																
Estimated percentage of all materials purchased in all other contiguous Counties																

# PINE BLUFF

## Pine Bluff Chemical Activity (Army Schedule)

Year 1 begins with the receipt of the Resource Conservation and Recovery Act permit. Please provide the data through official closure of the facility.

### Personnel Associated with the Chemical Weapons Demilitarization Program

PMCD	Systems Contractor	Chemical Activity (SBCCOM)	Depot	Other (Please specify):													
	FY 1	FY 2	FY 3	FY 4	FY 5	FY 6	FY 7	FY 8	FY 9	FY 10	FY 11	FY 12	FY 13	FY 14	FY 15		
<b>Construction Phase (Average Headcount)</b>																	
Military Personnel		1	1	1	1												
Civilians																	
Federal Government		29	43.25	73.25	113.5												
State/Local Government																	
Contractors (Construction)																	
Contractors (Chemical)		180	295.5	450.25	582												
<b>Systemization Phase (Average Headcount)</b>																	
Military Personnel					1	1											
Civilians																	
Federal Government					104.25	96.5											
State/Local Government																	
Contractors (Chemical)					572.25	578											
<b>Operations Phase (Average Headcount)</b>																	
Military Personnel								1	1								
Civilians																	
Federal Government								87.5	83								
State/Local Government																	
Contractors (Chemical)								566.5	462.75								
<b>Closure/Shutdown Phase (Average Headcount)</b>																	
Military Personnel									1	0.75							
Civilians																	
Federal Government									73.75	34.5							
State/Local Government																	
Contractors (Chemical)									172.25	3.75							
<b>Employee Demographics: Please estimate the percentage of workers that reside in the counties listed below:</b>																	
Jefferson County																	
All other contiguous Counties																	
<b>Estimated construction and material costs of the demilitarization facility (millions of 1999 dollars):</b>																	
Construction costs		78.525	67.3	73.625	60.675												
Estimated percentage of total construction costs that are materials																	
Total value of other recurring and nonrecurring material - costs not included in the above construction costs		46.375	50.875	51.225	23.875	5.525	5.65	5.6	5	5	3.75						
Estimated percentage of all materials purchased in Jefferson County																	
Estimated percentage of all materials purchased in all other contiguous Counties																	

## Pine Bluff Chemical Activity (Army Schedule + 3)

Year 1 begins with the receipt of the Resource Conservation and Recovery Act permit. Please provide the data through official closure of the facility.

### Personnel Associated with the Chemical Weapons Demilitarization Program

PMCD	Systems Contractor	Chemical Activity (SBCCOM)	Depot	Other (Please specify):													
	FY 1	FY 2	FY 3	FY 4	FY 5	FY 6	FY 7	FY 8	FY 9	FY 10	FY 11	FY 12	FY 13	FY 14	FY 15		
<b>Construction Phase (Average Headcount)</b>																	
Military Personnel		1	1	1	1												
Civilians																	
Federal Government		29	43.25	73.25	113.5												
State/Local Government																	
Contractors (Construction)																	
Contractors (Chemical)		180	295.5	450.25	582												
<b>Systemization Phase (Average Headcount)</b>																	
Military Personnel						1	1										
Civilians																	
Federal Government						104.25	96.5										
State/Local Government																	
Contractors (Chemical)						572.25	578										
<b>Operations Phase (Average Headcount)</b>																	
Military Personnel								1	1	1	1	1					
Civilians																	
Federal Government								87.5	83.75	86	86	85.25					
State/Local Government																	
Contractors (Chemical)								566.5	545.25	558	558	475.5					
<b>Closure/Shutdown Phase (Average Headcount)</b>																	
Military Personnel												1	0.75				
Civilians																	
Federal Government												73.75	34.5				
State/Local Government																	
Contractors (Chemical)														172.25	3.75		
<b>Employee Demographics: Please estimate the percentage of workers that reside in the counties listed below:</b>																	
Jefferson County																	
All other contiguous Counties																	
<b>Estimated construction and material costs of the demilitarization facility (millions of 1999 dollars):</b>																	
Construction costs		78.525	67.3	73.625	60.675												
Estimated percentage of total construction costs that are materials																	
Total value of other recurring and nonrecurring material - costs not included in the above construction costs		46.375	50.875	51.225	23.875	5.525	5.65	5.6	5.1	5.4	5.4	5.3	5	3.75			
Estimated percentage of all materials purchased in Jefferson County																	
Estimated percentage of all materials purchased in all other contiguous Counties																	
Remarks:																	

# PUEBLO

<b>Pueblo Chemical Depot (Army Schedule)</b> Year 1 begins with the receipt of the Resource Conservation and Recovery Act permit. Please provide the data through official closure of the facility. <b>Personnel Associated with the Chemical Weapons Demilitarization Program</b>																
PMCD	Systems Contractor				Chemical Activity (SBCCOM)				Depot	Other (Please specify):						
	FY 1	FY 2	FY 3	FY 4	FY 5	FY 6	FY 7	FY 8	FY 9	FY 10	FY 11	FY 12	FY 13	FY 14	FY 15	
<b>Construction Phase (Average Headcount)</b>																
Military Personnel																
Civilians																
Federal Government		105.65	163.8875													
State/Local Government																
Contractors (Construction)																
Contractors (Chemical)		483.525	927.45													
<b>Systemization Phase (Average Headcount)</b>																
Military Personnel																
Civilians																
Federal Government				192.35												
State/Local Government																
Contractors (Chemical)				904.95												
<b>Operations Phase (Average Headcount)</b>																
Military Personnel																
Civilians																
Federal Government					177.5	178.625										
State/Local Government																
Contractors (Chemical)					509.85	417.6										
<b>Closure/Shutdown Phase (Average Headcount)</b>																
Military Personnel																
Civilians																
Federal Government						136.5										
State/Local Government																
Contractors (Chemical)						157.275										
<b>Employee Demographics: Please estimate the percentage of workers that reside in the counties listed below:</b>																
Pueblo County																
All other contiguous Counties																
<b>Estimated construction and material costs of the demilitarization facility (millions of 1999 dollars):</b>																
Construction costs	143.05	109.2														
Estimated percentage of total construction costs that are materials																
Total value of other recurring and nonrecurring material - costs not included in the above construction costs	83.385	62.1	8.7975	5.04	5.625	6.75										
Estimated percentage of all materials purchased in Pueblo County																
Estimated percentage of all materials purchased in all other contiguous Counties																

<b>Pueblo Chemical Depot (Army Schedule +3)</b> Year 1 begins with the receipt of the Resource Conservation and Recovery Act permit. Please provide the data through official closure of the facility. <b>Personnel Associated with the Chemical Weapons Demilitarization Program</b>																
PMCD	Systems Contractor				Chemical Activity (SBCCOM)				Depot	Other (Please specify):						
	FY 1	FY 2	FY 3	FY 4	FY 5	FY 6	FY 7	FY 8	FY 9	FY 10	FY 11	FY 12	FY 13	FY 14	FY 15	
<b>Construction Phase (Average Headcount)</b>																
Military Personnel																
Civilians																
Federal Government		105.65	163.8875													
State/Local Government																
Contractors (Construction)																
Contractors (Chemical)		483.525	927.45													
<b>Systemization Phase (Average Headcount)</b>																
Military Personnel																
Civilians																
Federal Government				192.35												
State/Local Government																
Contractors (Chemical)				192.35												
<b>Operations Phase (Average Headcount)</b>																
Military Personnel																
Civilians																
Federal Government					177.5	177.5	177.5	178.625								
State/Local Government																
Contractors (Chemical)					509.85	490.725	500.2875	495.5063	426.2063							
<b>Closure/Shutdown Phase (Average Headcount)</b>																
Military Personnel																
Civilians																
Federal Government									136.5							
State/Local Government																
Contractors (Chemical)									157.275							
<b>Employee Demographics: Please estimate the percentage of workers that reside in the counties listed below:</b>																
Pueblo County																
All other contiguous Counties																
<b>Estimated construction and material costs of the demilitarization facility (millions of 1999 dollars):</b>																
Construction costs	143.05	109.2														
Estimated percentage of total construction costs that are materials																
Total value of other recurring and nonrecurring material - costs not included in the above construction costs	83.385	62.1	8.7975	5.04	4.59	4.815	4.7025	5.8275	6.75							
Estimated percentage of all materials purchased in Pueblo County																
Estimated percentage of all materials purchased in all other contiguous Counties																

**Pueblo Chemical Depot (ACWA +3)**

Year 1 begins with the receipt of the Resource Conservation and Recovery Act permit. Please provide the data through official closure of the facility.

**Personnel Associated with the Chemical Weapons Demilitarization Program**

PMCD <input type="checkbox"/>	Systems Contractor <input type="checkbox"/>	Chemical Activity (SBCCOM) <input type="checkbox"/>	Depot <input type="checkbox"/>	Other (Please specify): <input type="checkbox"/>															
		FY 1	FY 2	FY 3	FY 4	FY 5	FY 6	FY 7	FY 8	FY 9	FY 10	FY 11	FY 12	FY 13	FY 14	FY 15	FY 16		
<b>Construction Phase (Average Headcount)</b>																			
Military Personnel																			
Civilians																			
Federal Government		53.775	53.775	63.39375															
State/Local Government																			
Contractors (Construction)																			
Contractors (Chemical)			5	68.75															
<b>Systemization Phase (Average Headcount)</b>																			
Military Personnel																			
Civilians																			
Federal Government					88.5375														
State/Local Government																			
Contractors (Chemical)					246.25														
<b>Operations Phase (Average Headcount)</b>																			
Military Personnel																			
Civilians																			
Federal Government						77.4	77.4	77.4	77.4	77.4	77.4	77.4	77.4	77.4	72.5625				
State/Local Government																			
Contractors (Chemical)						395	560	558.75	555	555	481.25	315.8929	483.5714	483.5714	388.8911				
<b>Closure/Shutdown Phase (Average Headcount)</b>																			
Military Personnel																			
Civilians																			
Federal Government																58.05	43.5375		
State/Local Government																			
Contractors (Chemical)																104.85	78.6375		
<b>Employee Demographics: Please estimate the percentage of workers that reside in the counties listed below:</b>																			
Pueblo County																			
All other contiguous Counties																			
<b>Estimated construction and material costs of the demilitarization facility (then year dollars):</b>																			
Construction costs		45.8495	154.0343	163.6353	77.502														
Estimated percentage of total construction costs that are materials																			
Total value of other recurring and nonrecurring material - costs not included in the above construction costs			0.067	1.42925	5.84225	8.93825	10.54275	12.645	12.89825	13.1565	11.41475	6.912607	10.85043	10.85043	9.262821	4.5	3.375		
Estimated percentage of all materials purchased in Pueblo County																			
Estimated percentage of all materials purchased in all other contiguous Counties																			

**Pueblo Chemical Depot (ACWA Schedule)**

Year 1 begins with the receipt of the Resource Conservation and Recovery Act permit. Please provide the data through official closure of the facility.

**Personnel Associated with the Chemical Weapons Demilitarization Program**

PMCD <input type="checkbox"/>	Systems Contractor <input type="checkbox"/>	Chemical Activity (SBCCOM) <input type="checkbox"/>	Depot <input type="checkbox"/>	Other (Please specify): <input type="checkbox"/>															
		FY 1	FY 2	FY 3	FY 4	FY 5	FY 6	FY 7	FY 8	FY 9	FY 10	FY 11	FY 12	FY 13	FY 14	FY 15	FY 16		
<b>Construction Phase (Average Headcount)</b>																			
Military Personnel																			
Civilians																			
Federal Government		53.775	53.775	63.39375															
State/Local Government																			
Contractors (Construction)																			
Contractors (Chemical)			5	68.75															
<b>Systemization Phase (Average Headcount)</b>																			
Military Personnel																			
Civilians																			
Federal Government					88.5375														
State/Local Government																			
Contractors (Chemical)					246.25														
<b>Operations Phase (Average Headcount)</b>																			
Military Personnel																			
Civilians																			
Federal Government						77.4	77.4	77.4	77.4	77.4	77.4	72.5625							
State/Local Government																			
Contractors (Chemical)						395	560	558.75	555	555	481.25	221.2125							
<b>Closure/Shutdown Phase (Average Headcount)</b>																			
Military Personnel																			
Civilians																			
Federal Government													58.05	43.5375					
State/Local Government																			
Contractors (Chemical)													104.85	78.6375					
<b>Employee Demographics: Please estimate the percentage of workers that reside in the counties listed below:</b>																			
Pueblo County																			
All other contiguous Counties																			
<b>Estimated construction and material costs of the demilitarization facility (then year dollars):</b>																			
Construction costs		45.8495	154.0343	163.6353	77.502														
Estimated percentage of total construction costs that are materials																			
Total value of other recurring and nonrecurring material - costs not included in the above construction costs			0.067	1.42925	5.84225	8.93825	10.54275	12.645	12.89825	13.1565	11.41475	5.325	4.5	3.375					
Estimated percentage of all materials purchased in Pueblo County																			
Estimated percentage of all materials purchased in all other contiguous Counties																			

# UMATILLA

<b>Umatilla Chemical Depot (Army Schedule)</b> Year 1 begins with the receipt of the Resource Conservation and Recovery Act permit. Please provide the data through official closure of the facility.																
<b>Personnel Associated with the Chemical Weapons Demilitarization Program</b>																
PMCD	Systems Contractor				Chemical Activity (SBCCOM)				Depot	Other (Please specify):						
	FY 1	FY 2	FY 3	FY 4	FY 5	FY 6	FY 7	FY 8	FY 9	FY 10	FY 11	FY 12	FY 13	FY 14	FY 15	
<b>Construction Phase (Average Headcount)</b>																
Military Personnel																
Civilians																
Federal Government		24	41.25	52.75	65.25											
State/Local Government		4	7.5	9	9											
Contractors (Construction)																
Contractors (Chemical)		63.75	132	258.25	413											
<b>Systemization Phase (Average Headcount)</b>																
Military Personnel																
Civilians																
Federal Government					85.75	163										
State/Local Government					9	9										
Contractors (Chemical)					488.75	552										
<b>Operations Phase (Average Headcount)</b>																
Military Personnel																
Civilians																
Federal Government							163	163	163	163						
State/Local Government							9	9	9	9						
Contractors (Chemical)							572.5	568.25	498	255						
<b>Closure/Shutdown Phase (Average Headcount)</b>																
Military Personnel																
Civilians																
Federal Government											126.75	13.5				
State/Local Government											9	6.75				
Contractors (Chemical)											67.75	14.25				
<b>Employee Demographics: Please estimate the percentage of workers that reside in the counties listed below:</b>																
Umatilla/Morrow Counties																
All other contiguous Counties																
<b>Estimated construction and material costs of the demilitarization facility (millions of 1999 dollars):</b>																
Construction costs	24.80198	83.9889	129.5131	53.30711	33.80385											
Estimated percentage of total construction costs that are materials																
Total value of other recurring and nonrecurring material -	1.020444	4.100144	4.808965	5.754161	3.727024	4.56801	5.607686	9.889144	8.969872	3.851994	0.265008					
costs not included in the above construction costs																
Estimated percentage of all materials purchased in Umatilla/Morrow Counties																
Estimated percentage of all materials purchased in all other contiguous Counties																

<b>Umatilla Chemical Depot (Army Schedule +3)</b> Year 1 begins with the receipt of the Resource Conservation and Recovery Act permit. Please provide the data through official closure of the facility.																
<b>Personnel Associated with the Chemical Weapons Demilitarization Program</b>																
PMCD	Systems Contractor				Chemical Activity (SBCCOM)				Depot	Other (Please specify):						
	FY 1	FY 2	FY 3	FY 4	FY 5	FY 6	FY 7	FY 8	FY 9	FY 10	FY 11	FY 12	FY 13	FY 14	FY 15	
<b>Construction Phase (Average Headcount)</b>																
Military Personnel																
Civilians																
Federal Government		24	41.25	52.75	65.25											
State/Local Government		4	7.5	9	9											
Contractors (Construction)																
Contractors (Chemical)		63.75	132	258.25	413											
<b>Systemization Phase (Average Headcount)</b>																
Military Personnel																
Civilians																
Federal Government					85.75	163										
State/Local Government					9	9										
Contractors (Chemical)					488.75	552										
<b>Operations Phase (Average Headcount)</b>																
Military Personnel																
Civilians																
Federal Government							163	163	163	163	163	163	163	163		
State/Local Government							9	9	9	9	9	9	9	9		
Contractors (Chemical)							572.5	568.25	498	360	504	504	393			
<b>Closure/Shutdown Phase (Average Headcount)</b>																
Military Personnel																
Civilians																
Federal Government														126.75	13.5	
State/Local Government														9	6.75	
Contractors (Chemical)														67.75	14.25	
<b>Employee Demographics: Please estimate the percentage of workers that reside in the counties listed below:</b>																
Umatilla/Morrow Counties																
All other contiguous Counties																
<b>Estimated construction and material costs of the demilitarization facility (millions of 1999 dollars):</b>																
Construction costs	24.80198	83.9889	129.5131	53.30711	33.80385											
Estimated percentage of total construction costs that are materials																
Total value of other recurring and nonrecurring material -	1.020444	4.100144	4.808965	5.754161	3.727024	4.56801	5.607686	9.889144	8.969872	5.594067	7.321637	7.321637	5.579564	0.265008		
costs not included in the above construction costs																
Estimated percentage of all materials purchased in Umatilla/Morrow Counties																
Estimated percentage of all materials purchased in all other contiguous Counties																

## **ABBREVIATIONS**





ABCDE	Aberdeen Chemical Agent Disposal Facility
ACE	Annistonians for a Clean Environment
ACWA	Assembled Chemical Weapons Assessment
ANAD	Anniston Army Depot
ANCA	Anniston Chemical Activity
ANCSD	Anniston Chemical Agent Disposal Facility
ATAP	Alternative Technologies and Approaches Project
BGAD	Blue Grass Army Depot
CSDP	Chemical Stockpile Disposal Program
CSEPP	Chemical Stockpile Emergency Preparedness Program
CY	calendar year
DCD	Deseret Chemical Depot
DoD	Department of Defense
ECA	Edgewood Chemical Activity
FEMA	Federal Emergency Management Agency
FY	fiscal year
GDP	Gross Domestic Product
IDA	Institute for Defense Analyses
IRZ	Immediate Response Zone
K	thousand
NECD	Newport Chemical Depot
NPV	net present value
NSCMP	Non-Stockpile Chemical Materiel Product
PAZ	Protective Action Zone
PBA	Pine Bluff Arsenal
PBCA	Pine Bluff Chemical Activity
PBCDF	Pine Bluff Chemical Agent Disposal Facility
PMCD	Program Manager for Chemical Demilitarization
PUCD	Pueblo Chemical Depot
RCRA	Resource Conservation and Recovery Act
REMI	Regional Economic Models, Inc.
RIMS	Regional Input-Output Modeling System

SBCCOM	Soldier and Biological Chemical Command
TOCDF	Tooele Chemical Agent Disposal Facility
UMCD	Umatilla Chemical Depot
UMCDF	Umatilla Chemical Agent Disposal Facility
WDC	Washington Demilitarization Company

UNCLASSIFIED

REPORT DOCUMENTATION PAGE			Form Approved OMB No. 0704-0188	
Public reporting burden for this collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 2220-4302, and to the Office of Management and Budget, Paperwork Reduction Project (0704-0188), Washington, DC 20503.				
1. AGENCY USE ONLY (Leave blank)		2. REPORT DATE June 2001	3. REPORT TYPE AND DATES COVERED Jan 2001–Jun 2001	
4. TITLE AND SUBTITLE “Assessment of the Need for Assistance to Communities Affected by Chemical Demilitarization: Final Report”			5. FUNDING NUMBERS DASW01 98 C 0067	
6. AUTHOR(S) Thomas P. Frazier, John W. Bailey, John J. Cloos, Henry L. Eskew, Shaun K. McGee, and Alec W. Salerno			Task Order AP-7-1975	
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) Institute for Defense Analyses 1801 N. Beauregard Street Alexandria, VA 22311-1772			8. PERFORMING ORGANIZATION REPORT NUMBER IDA Paper P-3623	
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES) Mr. Patrick Wakefield Office of the Assistant to the Secretary of Defense (Nuclear, Chemical, and Biological Defense Programs) Room 3C247, The Pentagon Washington, DC 20301			10. SPONSORING/MONITORING AGENCY REPORT NUMBER	
11. SUPPLEMENTARY NOTES				
12A. DISTRIBUTION/AVAILABILITY STATEMENT Approved for public release; distribution unlimited.			12B. DISTRIBUTION CODE	
13. ABSTRACT (Maximum 200 words) Congress is concerned about the negative economic consequences that construction, operation, and closure of eight chemical demilitarization facilities might have on their surrounding communities. IDA used a regional economic model called REMI to determine whether federal compensation to those communities is needed. The model estimated the incremental costs and benefits associated with each facility. The results suggest that the net economic impacts are usually negative for the counties where the facilities reside as well as for the greater local regions. But at the state level, the model consistently predicts a positive economic impact that outweighs the local losses.				
14. SUBJECT TERMS Demilitarization; Chemical Warfare Agents; Economic Impact; Economic Models; REMI Model			15. NUMBER OF PAGES 99	
			16. PRICE CODE	
17. SECURITY CLASSIFICATION OF REPORT Unclassified	18. SECURITY CLASSIFICATION OF THIS PAGE Unclassified	19. SECURITY CLASSIFICATION OF ABSTRACT Unclassified	20. LIMITATION OF ABSTRACT SAR	

UNCLASSIFIED

